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# New Newsprint Prorating Plan Announced

## Plan Merges Productive Resources of All 25 Canadian Newsprint Mills Under Control of Administrator Weldon — Ruling Fixes Annual Output at 3,257,302 Tons — Important Details Given.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., January 18, 1943—At last Canada's 25 newsprint mills know exactly where they stand in respect to the proportion of business coming to Canada on which they can individually count. They will know to what level they can produce and sell and still retain all the profits and the dividing line above which they will have to pay into a central pool from which less fortunate mills will be able to draw compensation for the tonnage they have been unable to handle owing to war conditions.

The new prorating plan represents a clean sweep of all previous associations and entanglements, and an attempt to remove the bitter controversy which arose out of the scheme developed by the Newsprint Association of Canada, which was strongly opposed by minority groups in Ontario and Quebec.

Under the new plan all mills are treated the same, with no penalties for past activities. In effect the plan welds Canada's 25 newsprint mills into one homogeneous whole. Mr. Weldon, as administrator, has control over all operations and can tell any mill how much it can produce, how much it can ship and he can divert wood from one mill to another. He has absolute power.

Order No. 222 gives the answer to a question the industry has been wondering about for some time —the method of compensation for transferred tonnage. Each mill is alloted a fixed percentage of the available business. This percentage is based on the rated capacity of a mill, orders on its books, shipments, past performances, and other factors, and establishes the position at which the mill will operate for the duration.

### New Order Fixes Maximum Output

The "freeze" order has been superseded by another order which sets maximum operations on deliveries at 90% of October, 1941, to March, 1942, average rates. These figures tend to raise slightly the maximum tonnage which can be produced, but do not change the relative standing of the mills. On a capacity basis, 15 of the 25 mills will be in a better position under the new ruling, because their costs are low, because the orders on their books are large, because they have been heavy shippers, or because of other factors.

On a purely capacity basis, Abitibi would be entitled to 605,000 tons annually, but it receives a rating of 572,440 tons. Ontario Paper Mills at Thorold, on the other hand, which has been operating on a capacity basis for years and with relatively low costs, receives a rating well above its former figure. However, all mills, whether they have been operating at capacity or not, whether their costs have been high or low, assume their share of the responsibility of keeping the industry solvent under the new plan, in so far as business available will permit.

### Full Rated Capacity Taken

Presumably the full rated capacity was taken as 100% to establish the new rated capacity on the business available. When a mill for any reason is unable to reach its new rated capacity it is entitled to draw down from the central pool sufficient to make up the difference and when a mill exceeds the new rated capacity it will pay into the fund all excess profits.

Under the new order, amounts which manufacturers are to remit or receive in consequence of allocation and other controls exercised since September 1 last are to be fixed by the administrator on or before January 20. Remittances to the fund and payments to other manufacturers are to be made on or before January 25 and payments out of the fund by February 1.

### Production Limited to 3,257,302 Tons

Under the ruling changing the freezing order from the average level of output between April and October, 1942, to 90% of the average shipments from October, 1941, to March, 1942, the total production of Canadian mills will be limited to 3,257,302 tons annually. Under the older order production was frozen at slightly over 3.1 million tons annually. Whether production reaches the new figure in 1943 depends on the availability of business, the power supply, manpower available, transportation and wood supply. The prospects for reaching this desirable state are not altogether favorable at the moment.

# Would Safeguard Post-War Employment

## Wisconsin Chamber of Commerce Urges Paper Manufacturers to Support Three-Point Legislative Program to Cushion Shock at End Of War—Old Labor Suit Remains Unsettled—Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., January 18, 1943—Paper manufacturers are among those urged by the Wisconsin Chamber of Commerce to support state legislation which would safeguard the solvency of their unemployment compensation reserves under the state unemployment compensation system during the shocks of the post-war period.

It is pointed out that there will probably be a terrific drain upon employers' reserves during the transition to peacetime production after the war, although it is not expected to affect the paper industry as much as those operating 100% on direct war materials.

Three major proposals in the legislative program are:

Increased contributions by employers to their reserves on a voluntary basis, over and above the contributions required under the present law. Such contributions are deductible under the income tax laws, it was pointed out.

A change in the formula for determining the rate of employer contribution from a three-year average of annual payroll to a one-year average, thus reflecting very recent payroll expansions and thus forcing also a higher immediate contribution to unemployment reserves.

A provision for special "war risk" unemployment compensation contribution rates, to be graduated according to the percentage of increase in employment and payroll of companies.

Although there have been attempts to "federalize" the Wisconsin unemployment compensation system by throwing all funds into one hopper, Wisconsin has been able to maintain its original law, the first to be enacted in the United States, whereby each employers' contributions are allocated to his account for his own workers, thus preserving initiative to keep unemployment at a minimum. The industry thus is able to build up its reserve to a required maximum and then cease contributions until withdrawals are necessary. Most paper mills have built their reserves to this point and have not made extensive contributions in the last few years. The new legislation is based on the assumption that the Wisconsin law will still withstand the pressure of federal social security authorities who want it converted to the U. S. government plan.

### Old Labor Suit Still Unsettled

A five-year-old labor dispute of the former Fox River Paper Company, Appleton, Wis., remains unsettled as the result of a ruling of the Wisconsin Supreme Court last week that it had no jurisdiction in the creation of an arbitration board.

The dispute arose in 1938 when the company announced a wage cut of five cents an hour for male workers and three cents for women. The employees, represented by Local No. 16, International Brotherhood of Papermakers, filed protests. The company and the union agreed to a three-man board of arbitration representing both parties, with a third to be named by the first two. In case of disagreement on a third member, the appointment was to be made by the circuit court.

The court was called upon to make the appointment but did not do so prior to the sale of the company's assets to the present Fox River Paper Corporation, at which time the relations with the union ceased. When Judge J. R. McCarthy succeeded Judge E. V. Warner in office, the union brought up the matter and on December 8, 1941, the third arbiter was named. The board consisted of Attorney Edward J. Dempsey, representing the company, Raymond A. Richards, Wisconsin Rapids, Wis., the union, later succeeded by Walter A. Graunwe, Wausau, Wis., and Gerald Jolin, Hortonsville, Wis., named by the court.

The Fox River Paper Company appealed from Judge McCarthy's order appointing the third member of the arbitration board, claiming that Mr. Dempsey had never acted as arbitrator for the company, and that after the sale of the assets of the corporation all relations with the union ceased and the court had no jurisdiction over Dempsey.

The supreme court ruled that neither the company nor the union could, by agreement, confer jurisdiction upon a judicial tribunal, and that the action of Judge McCarthy was a personal one by the jurist and not an official court order. It ruled, therefore, that the appeal had to be dismissed.

### Dr. Copeland Addresses Safety Meetings

Two Fox River Valley safety rallies are having as their speaker Dr. Charles Copeland Smith of the speakers' bureau of the National Manufacturers Association.

He addressed the first of these Saturday evening of last week at Kaukauna, Wis., sponsored by the Thilmany Girls Club of the Thilmany Pulp and Paper Company. It was held at the high school auditorium, with a large attendance. Group meetings for men and women were held in the afternoon to witness safety demonstrations.

The second rally was to be staged Tuesday evening of this week at the Menasha high school auditorium by the Twin City Industrial Safety Council of Neenah and Menasha, Wis. C. B. Anderson of the Central Paper Company was to serve as chairman, and the Menasha high school band was scheduled to furnish a concert. Dangers of gasoline hoarding were to be demonstrated by G. S. Kessler, supervisor of fire prevention for the Wisconsin Industrial Commission.

Two more Twin City rallies will be held. On February 16, Dr. Richard Struna will speak at the Neenah high school auditorium. He was the last American to leave Czechoslovakia before America's entry into the war. Herman Goffin will serve as

chairman. On March 23, the speaker will be William D. Saltiel, assistant United States attorney general and the gathering will be at the Menasha high school. Charles Abel will be the chairman.

On Monday of this week, Dr. Copeland spoke at a Chamber of Commerce luncheon at Appleton, Wis., on "The Trend of Industry in the War."

### Marathon Celebrates Safety Record

Employees of the carton shipping department of the Marathon Paper Mills Company division at Menasha, Wis., held a celebration January 13 at Eagles hall upon completion of four consecutive years of 1,419 working days without a lost-time accident. Since heavy materials handling is responsible for 33% of all reported injuries, the record is considered outstanding. Congratulations were extended by Howard Aderhold of the personnel department.

### B. W. Rowland Granted Clay Patent

Ben W. Rowland, Appleton, Wis., has been granted a patent for a modified clay. It has been assigned to Edgar Bros. Company, Metuchen, N. J. The clay will be an improvement of product largely for specialty paper manufacture.

### Paper Men Elected Bank Directors

Cola G. Parker, president of Kimberly-Clark Corporation, was elected a director of the First National Bank, Neenah, Wis., at the annual meeting January 12. Among those reelected to the board are: J. N. Bergstrom, president of Bergstrom Paper Company; D. K. Brown, president of Neenah Paper Company; C. B. Clark, president of Riverside Paper Corporation, Appleton, Wis.; F. J. Sensenbrenner, chairman of the board, and Ernst Mahler, vice-president, of Kimberly-Clark Corporation, and John R. Kimberly, vice-president of International Cellucotton Products Company. Mr. Bergstrom was re-elected vice-president by the board.

The National Manufacturers Bank, Neenah, Wis., reelected as directors A. C. Gilbert, president of the Gilbert Paper Company, Menasha, Wis., and S. F. Shattuck, vice-president of Kimberly-Clark Corporation. Both are vice-presidents of the bank.

At the annual meeting January 12 of the First National Bank, Appleton, Wis., the following were among the directors reelected: C. B. Clark, who is the bank's vice-president; F. J. Sensenbrenner; Charles S. Boyd, president of Appleton Coated Paper Company; W. E. Buchanan, president of Appleton Wire Works; R. H. Purdy, general manager, Tuttle Press Company; Karl E. Stansbury, president of Thilmany Pulp and Paper Company, Kaukauna, Wis., and William C. Wing, retired president of the former Fox River Paper Company.

F. E. Sensenbrenner, assistant secretary-treasurer of Kimberly-Clark Corporation, and Paul Strange were reelected directors of the Bank of Menasha, Menasha, Wis.

## Paper Books for Historical Society

Charles McDowell, Philadelphia, Pa., paper manufacturer who died on December 20, leaving an estate valued in excess of $523,000, has willed that all of his books and papers relating to the manufacture of paper be given to a historical society to be chosen by the executors of the estate.

## OPA Issues Tissue Paper Amendment

WASHINGTON, D. C., January 20, 1943 — Special provision to compensate manufacturers who cannot under prevailing ceilings meet higher costs of shipping toilet tissue in the new cartons required by Army specifications was announced today by the Office of Price Administration.

Amendment No. 2 to Maximum Price Regulation No. 266 (Certain Tissue Paper Products), effective January 12, 1943, permits the addition, under certain circumstances, of the net increase in cost of casing materials and metal strapping. The new Army specifications calls for a special weather-proof shipping carton, sealed with a water-resistant adhesive, and in some instances metal strapping around the shipping carton. In this way these toilet tissue cartons can withstand extreme moisture conditions.

Amendment No. 2 also sets out a method for determining ceilings of manufacture on sales of toilet tissue and paper towels on an f.o.b. mill basis; provides a price determining method for manufacturers doing their own wholesaling; releases distributors who purchase from certain manufacturers from the restriction of March 1942 prices; extends the regulation's coverage to sheets having a square inch area per sheet of 41 square inches; exempts certain paper towels sold through coin-operated vending machines; clarifies the phrase "prices charged for deliveries in March, 1942"; and permits distributors to use a "minimum" maximum mark-up of 85% of their March mark-up.

The new amendment also provides a method for determining prices of toilet tissue and paper towels for all sales by manufacturers on an f.o.b. mill basis. Regulation No. 266 previously had made no provision for such sales. Certain manufacturers ship to commercial purchasers on this basis, and, in addition, the Navy is now requesting bids for paper towels on an f.o.b. mill basis so as to utilize the facilities of certain inland mills and in order to take advantage of lower freight rates available on land-grant railroads.

## Now Wyandotte Chemicals Corp.

Back in the 1890's, two companies were established in Wyandotte, Michigan, by Captain John B. Ford, father of the plate glass industry in America, and an outstanding pioneer in the chemical industry.

The Michigan Alkali Company grew to be one of the great basic chemical companies of the world, manufacturing a wide range of products serving more than fifty different industries.

The J. B. Ford Company developed into the world's largest manufacturer of specialized cleaning materials, and an important factor in promoting sanitation and safeguarding the health of America. The company controls warehouse facilities strategically located at approximately 200 points throughout the country.

On January 1, 1943, these companies were consolidated, still under the same family ownership, to form the Wyandotte Chemicals Corporation.

This consolidation is a logical recognition of the close relationship which has existed between the companies for many years.

Management and personnel will remain the same, but the consolidation will offer an opportunity for even greater service to customers.

# Impending Scarcity Creates Heavy Demand

## WPB Curtailment Orders Reported to Have Stimulated Buying of Major Classes of Paper—Limited Use of Wood Pulp in Folding Boxes Protested — Chicago Paper Association Holds Meeting.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., January 18, 1943—The Chicago paper market continues to "boil" as curtailment orders and threats of further scarcity in the pulp market combined to cause buyers to rush to the market. That part of the WPB order affecting the manufacture of folding boxes had a disquieting effect among box users in the area and efforts are under way to get an opportunity for folding box makers to put more of their ideas into actual use. The announcement of curtailment caused increasingly bullish tendencies to appear in the box board industry and to give added strength to krafts and allied lines. Groundwoods were exceptionally strong and newsprint commitments were also heavy following orders governing "rationing" of newspaper sizes. Sulphites were reported at the peak of demand with all prices very firm. Books and covers made further advances and additions to an order backlog extending many weeks ahead. Deliveries in all grades were being promised for from late March to May as the local industry reported its representatives trying to coordinate limited production facilities and limited raw materials with the rush to buy. Waste papers also showed more strength and particularly those grades wherein more usage will be expected following pulp curtailment.

### WPB Order Riles Merchants

The recent order of the War Production Board to limit the use of wood pulp in the making of folding boxes has created an unexpected reaction among the retail merchants in the city of Chicago. On January 15 the retail merchants, through the Illinois Federation of Retail Associations, asked national retail trade groups to take action on the effects of this order on the quality of boxes used in stores. The statement "calls attention to recent restrictions on pulp production under the WPB order and the situation it may create. It is our understanding that the order so severely curtails the production of pulp for the making of folding boxes that the folding box manufacturers are going to be forced to use a product made from waste paper. The retail stores in Illinois who have investigated the effect of this order have advised us that such boxes would be so flimsy as to be unusable. They believe it would be impossible to send these boxes down a chute much less use them satisfactorily for any kind of delivery purpose. The only procedure left would be for them to simply roll the paper board around the packages."

"We realize the importance of pulp in the war effort," declared the Federation, "but we would like to make the suggestion that the WPB give more thought to the proposals of the box manufacturers themselves. It is our understanding that the box makers can do the job with the available supplies if allowed to work out their own suggestions. We are for complete sacrifice, if necessary, but we believe retailing should work with the box makers in being certain it is necessary to make a sacrifice which would have a very detrimental effect on store procedure and consumer appearance."

### Weil Assumes Association Leadership Post

The Chicago Paper Association is assured of the same inspirational leadership which characterized its procedure last year as S. S. Weil assumes the directorship of the organization for the coming twelve months. Mr. Weil, Joseph Weil & Company, was re-elected president of the Association at its annual meeting held recently. Other officers were reelected including Robert Levinson, Eagle Wrapping Products Company, and Harry E. Weinstein, Western Bag & Paper Company, vice presidents, and William S. Knox, Knox & Schneider, secretary. Directors for the coming twelve months include Leo S. Altholz, Inlander Steindler Paper Company; Mortimer Inlander of Inlander Brothers; William Chukerman of J. Chukerman & Sons, and Joseph Druth of the Chippewa-Arrow Paper Company. From Mr. Weil's acceptance remarks it is obvious that the Association will make every effort to expand the membership and to work closely on many matters of vital importance to the coarse paper industry here. During the twelve months just past the Association did increase its membership and the scope of its work until today it is recognized as one of the leaders in its field.

### Adds New Lines

Recent anonuncement from Dwight Brothers Paper Company indicates the additions of several new lines as follows: The Mead Sales Company lines of Mead Bond, Ledger and Mimeo Bond; Champion Paper & Fibre Company's Kromekote Cover; Port Huron Paper Company's Huronette and a new line of Wizard Coated Cover.

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## Brotherhood Opposed to All Strikes

[FROM OUR REGULAR CORRESPONDENT]

FORT EDWARD, N. Y., January 18, 1943—The executive board of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers held their annual meeting here last week and voted to oppose all strikes, walkouts and lockouts for the duration of the war. The board declared that all controversies shall be settled by conciliation. John P. Burke, international president and secretary of the organization, presided at the gathering which was largely attended. In exemplification of its recommendation that all locals and union members invest in war bonds, the officers disclosed that the international union already holds more than $300,000 in bonds of the United States, Canadian and Newfoundalnd governments and all union receipts beyond actual operating expenses will be placed in war bonds.

The fourteen members of the executive board who met here came from various parts of the United States and Canada.

# TAPPI Annual Meeting Tentative Program

## Commodore Hotel, New York, N. Y., February 15-18, 1943

### Monday, February 15, 1943

9:30 A. M. GENERAL SESSION
R. A. Hayward, Chairman

1. *Secretary's Report* by R. G. Macdonald.
2. *President's Address* by R. A Hayward.
3. *Some Factors in Detergency* by Foster Dee Snell.
4. *Development of Wartime Paper Products* by John Strange, War Production Board.

2:00 P. M. GRAPHIC ARTS SESSION
M. S. Kantrowitz, Chairman

1. *Beater Practice in the Manufacture of Lithographic Papers* by C. G. Weber, M. B. Shaw, and M. J. O'Leary, Bureau of Standards.
2. *Ink Drying as Affected by Various Paper Stocks* by M. J. Leckey, Sinclair & Valentine Company.
3. *Applications of Lithographic Processes to War Work* by W. H. Wood, Harris-Seybold-Potter.
4. *Printing Papers* by L. W. Claybourne, J. W. Clement Company.
5. *Relation of Ink to Paper* by H. J. Wolfe, Kienle Co.

2:00 P. M. WATER AND WASHING SESSION
Paul Hodges and L. B. Miller, Chairmen

1. *Continuous Washing of Chemical Pulp* by J. P. Rich and J. H. Noble, Improved Paper Machinery Co.
2. *Efficient Reuse of Process Water for Pulp Washing* by H. A. Morrison, Oliver United Filters, Inc.
3. *Use of Metaphosphate in Pulp Washing* by E. R. Lang and E. T. Laurin, N. Y. State College of Forestry.
4. *Paper Mill Operating Experience with Accelator Softeners and Clarifiers* by A. C. Embshoff, Infilco, Inc.
5. *Status of Chlorine and Ammonia for Use by Paper Manufacturers* by R. B. Martin, Wallace and Tiernan, Inc.
6. *Pump and Water Equipment Maintenance* by A. T. Nielsen, Worthington Pump and Machinery Company.

### Tuesday, February 16, 1943

9:30 A. M. PACKAGING AND CONTAINER SESSION
J. D. Malcolmson, Chairman

1. *Packaging Requirements for Dehydrated Vegetables* by J. R. Sanborn and G. J. Hucker, N. Y. State Agri. Exp. Sta.
2. *Fiber Cans and Substitute Packages in Wartime* by T. E. Dobbins, F. H. Bopp, and R. P. Bigger, American Can Company.
3. *Improvement in Weatherproof Container* by E. R. Hankins, Hankins Container Company.
4. *Rule 41 and the Flat Crush Test* by Pierre Drewsen, Hinde & Dauch Paper Company.
5. *Relation between Test on Corrugated Board (Vertical Compression and Bending) and the Top to Bottom Olsen Test on Boxes from such Boards* by John Little, Hinde & Dauch Paper Company.

9:30 A. M. PULPING SESSION
S. D. Wells, Chairman

1. *Utilization of Cornstalks in the Manufacture of Paper and Paperboard* by S. D. Wells, Institute of Paper Chemistry.
2. *Agricultural Residue Pulps—Bleaching Studies on Straw Pulps* by S. I. Aronovsky, G. H. Nelson, and E. C. Lathrop, Bureau of Agricultural Chemistry and Engineering.
3. *Further Comparison of Sodium and Calcium Base Sulphite Acids II* by M. O. Schur and Eugene Ingalls, Brown Company.
4. *The Effect of Chemical-Wood Ratio in Pulping Douglas Fir by the Sulphate Process* by J. S. Martin and M. W. Bray, Forest Products Laboratory.
5. *Kraft Waste Disposal Studies* by J. A. Extrom, Tomahawk Kraft Paper Co.

2:00 P. M. SPECIFICATIONS AND TESTS SESSION
A. W. Nickerson, Chairman

1. *Ultimate Strength of Pulp Fibers and the Zero-Span Tensile Strength Test* by J. d'A. Clark, Institute of Paper Chemistry.
2. *Wartime Government Specifications* by M. S. Kantrowitz and R. H. Simmons, Government Printing Office.
3. *The Relationship between the Air and Oil Permeability of Paper* by W. H. Lane, Institute Paper Chemistry.
4. *Symposium on Water Vapor Permeability Testing.* Speakers to be announced.

2:00 P. M. PULPING SESSION
Paul Hodges, Chairman

1. *The Effect of Various Cooking Conditions on the Bleachability and Strength Characteristics of Kraft Pulp* by E. H. Hill, North Carolina Pulp Co.
2. *Toll Oil and the War Effort* by Arthur Pollack, West Virginia Pulp and Paper Co.
3. *Economic Trends relating to Waste Papers* by P. M. Loddengaard, Bulkley, Dunton Pulp Co.
4. *Reuse of Old Papers* by Frederic C. Clark.

### Wednesday, February 17, 1943

9:30 A. M. PAPERMAKING SESSION
A. E. Bachman, Chairman

1. *Surface Treatment of Paperboard in Calenders* by Albert Yraola, Hinde & Dauch of Canada, Ltd.
2. *General Conditions Affecting Smoothness* by H. C. Melenbacher, Container Corporation of America.

3. *The Use of Melamine Resins for Beater Wet Strength* by C. S. Maxwell, American Cyanamid & Chemical Corp.
4. *The Role of Hydroxyl Groups of Cellulose and Pentosans in the Water Binding Phenomenon in the Beating Process* by W. A. Aiken, Institute of Paper Chemistry.

9:30 A. M. ENGINEERING SESSION
Roderick O'Donoghue and W. G. MacNaughton Chairmen

1. *Features of Adjustable Speed Electric Driers to Meet the Requirements of the Paper Industry* by R. R. Baker, Westinghouse Elec. & Mfg. Co.
2. *Care and Choice of Refractories* by David Weinthe, A. P. Green Co.
5. *Wartime Modifications of Peacetime Industrial Maintenance and Operating Practices* by Floyd Davis, West Virginia Pulp & Paper Co.
4. *Metallographic Examination of Plant Equipment* by M. M. Rubin.

2:00 P. M. TESTING DIVISION SESSION
B. W. Scribner, Chairman

1. *Dyestuff Absorption by Fillers and Their Effect on the Color of Filled Papers* by Otto Kress and P. Trucano, Institute of Paper Chemistry.
2. *Flow Properties of Coating Clays at High Rates of Shear* by K. A. Arnold, Institute Paper Chemistry.
3. *The Resistance of Sized Papers and Paperboard to Water at Elevated Temperatures* by P. W. Codwise, Beaver Wood Fibre Company.
4. *New Analytical Methods for Oxycellulose and Oxystarches* by E. K. Gladding and C. B. Purves, Massachusetts Institute of Technology.
5. *The Photochemical Stability of Paper* by H. F. Launer and W. K. Wilson, Bureau of Standards.

2:00 P. M. ENGINEERING SESSION
Roderick O'Donoghue, Chairman

1. *Heat Utilization in Evaporating Black Liquor* by G. E. Seavoy and J. P. Rubush, Swenson Evaporator Company.
2. *Pulp, Paper, and Pumps* by N. A. Pederson, The La Bour Co.
3. *Drier Drainage* by Roderick O'Donoghue.
4. *Drying Rates for Newsprint* by W. G. MacNaughton, News Print Service Bureau.

2:00 P. M. PAPERMAKING SESSION
A. E. Bachmann, Chairman

Round Table Discussion Paper Machine Cylinder Design.

1. *The Cylinder Machine Vat Circle* by J. B. Gough, Mead Corp.
2. *Diatomaceous Silica in Patent Coated Liner and Liner Stock* by W. R. Monette, Dicalite Co.

**Thursday, February 18, 1943**

9:30 A. M. SECOND GENERAL SESSION
Vance P. Edwardes, Chairman

1. *Rayon and the War* by D. B. Wicker, American Viscose Co.
2. *Address*—A. G. Wakeman, Director, Pulp and Paper Division, War Production Board.

1:30 P. M. ANNUAL LUNCHEON
R. A. Hayward, presiding

1. *Presentation of TAPPI Medal to Harry Fletcher,* Fletcher Paper Co., and First President of the Technical Association.
2. *Address*—To be announced.

## Glatfelter Co. Holds Safety Meeting

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., January 18, 1943 — Seven hundred people, employees of the P. H. Glatfelter Company, their families and friends, attended the Fourth Annual Community and Industrial Safety meeting, sponsored by the paper mill, on Tuesday evening, January 5.

This annual event was inaugurated as a part of a well coordinated plan for developing greater safety and safety-mindedness among the employees in the plant and in the home.

P. H. Glatfelter, president of the company, presided and stressed that health and safety are not only of great value to a local community but have a far reaching effect. He pointed out that though the Glatfelter Company can not manufacture tanks, bullets or other war materials, a great percentage of its product is used for factory forms and other essential paper requirements in war industries without which they could not function efficiently. It is also used by the Army and Navy and many government departments, "hence the efficient workmanship in our mill as in all industries is" he said, "essential if our total effort is to achieve the high goals that have been set."

Other speakers were Henry D. Schmidt, president of Schmidt and Ault Paper Company, York, Pa., and director of the York County Defense Council, and Edwin C. Resser, chairman of the York County War Savings Staff. Both speakers paid tribute to the Glatfelter Company on their record of bond purchases, and on being the first industrial concern to win the Minute Man Flag in York County, as soon as the 10% bond drive started.

## Philadelphia Association Meets

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., January 18, 1943—At the annual meeting of the Paper Trade Association of Philadelphia, held January 13, Ralph Luff of D. L. Ward Company was elected president; Fred Balch of Schuylkill Paper Company, vice-president of Fine Paper Division; Henry Adler, The Huff Paper Company, vice-president of Wrapping Paper Division; W. Predmore, Paper Merchants, treasurer, and R. W. Fishburn, Whiting Patterson Co., secretary. The following were elected members of the Board of Governors: For one year, Nathanial Saxe, The Saxe Paper Company; Charles Wilder, Wilder Brothers Co., George Weaver, Garrett-Buchanan Co.; Edward Walter, Wilcox-Walter-Furlong Co.; For two years, Henry Adler, The Huff Paper Company; Nils Herdalin, The Terminal Paper Company; Ross W. Fishburn, Whiting Patterson Co.; A. M. Russell, The Holten Paper Company. For three years, Ralph Luff, D. L. Ward Co.; Frank O'Neill, Paper Manufacturers; Fred Balch, Schuylkill Paper Company; W. Predmore, Paper Merchants.

# Here is useful information on ETHOCEL properties

TOUGHNESS

TOUGHNESS

RESISTANCE
TO HEAT

STABILITY
TO LIGHT

LOW
SPECIFIC GRAVITY

COMPATIBILITY
WITH MOST PLASTICIZERS AND RESINS

LOW
FLAMMABILITY

SOLUBILITY
IN LOW COST SOLVENTS

FLEXIBILITY
AT LOW TEMPERATURES

One of the unique characteristics of ETHOCEL coatings is that, unlike other coating materials, they not only possess toughness at ordinary temperatures, but retain this toughness over a wide temperature range. An ETHOCEL coating, which is tough and durable at temperatures between 70° and 180° F, is also resistant to deformation and cold check at temperatures well below zero. Certain ETHOCEL coatings have been observed to possess unusual resistance to impact at temperatures even as low as –60° F.

It is this inherent toughness which makes ETHOCEL coatings valuable for a wide variety of uses in which ordinary bases would not be suitable. ETHOCEL coatings can be formulated to withstand a great number of cold check test cycles, where the temperature range varies from 180° F to that of dry ice.

**THE DOW CHEMICAL COMPANY**
**MIDLAND, MICHIGAN**

New York • St. Louis • Chicago • Houston • San Francisco
Los Angeles • Seattle

# ETHOCEL

**(DOW ETHYLCELLULOSE)**

DOW

CHEMICALS INDISPENSABLE
TO INDUSTRY AND VICTORY

# FINANCIAL NEWS

### New York Stock Exchange

High, Low and Last for Week Ending January 16, 1943

STOCKS

| | High | Low | Last |
|---|---|---|---|
| A. P. W. | 1⅝ | 1⅝ | 1⅝ |
| Armstrong Cork Co. | 32½ | 30½ | 32½ |
| Celotex Corp. | 9⅛ | 8⅜ | 9⅛ |
| Celotex Corp., pf. | 80 | 78½ | 79½ |
| Certain-Teed Products Corp. | 3½ | 3⅛ | 3½ |
| Certain-Teed Products Corp., pf. | 34⅜ | 33¼ | 34 |
| Champion Paper & Fibre Co. | .... | .... | .... |
| Champion Paper & Fibre Co., pf. | 100 | 100 | 100 |
| Congoleum Nairn Co. | 18¼ | 17⅞ | 18¼ |
| Container Corp. of America | 18 | 16⅛ | 17⅞ |
| Continental-Diamond Fibre Co. | 7¾ | 7½ | 7¾ |
| Crown-Zellerbach Co. | 12⅛ | 11½ | 12 |
| Crown-Zellerbach Co., pf. | 82 | 81½ | 81¾ |
| Dixie-Vortex Co. | 10¼ | 10¼ | 10¼ |
| Dixie-Vortex Co.—A. | 40 | 39 | 39½ |
| Flintkote Co. | 16½ | 15⅜ | 16½ |
| Robert Gair | 2 | 1¾ | 2 |
| Robert Gair, pf. | 10 | 9⅜ | 10 |
| International Paper Co. | 9⅜ | 8¾ | 9⅜ |
| International Paper Co., pf. | 51½ | 49¼ | 51 |
| Johns-Manville Corp. | 72¾ | 71¼ | 72 |
| Johns-Manville Corp., pf. | .... | .... | .... |
| Kimberly-Clark Corp. | 26½ | 25¼ | 26½ |
| MacAndrews & Forbes | 21 | 20½ | 20½ |
| MacAndrews & Forbes, pf. | .... | .... | .... |
| Masonite Corp. | 32⅜ | 32¾ | 32¾ |
| Mead Corp. | 6¾ | 6¼ | 6¾ |
| Mead Corp., pf. A.—6% | 68½ | 68½ | 68½ |
| Mead Corp., pf. B—5½% | 60 | 60 | 60 |
| Paraffine Companies, Inc. | 36 | 35¼ | 35¼ |
| Paraffine Companies, Inc., pf. | .... | .... | .... |
| Rayonier, Inc. | 12 | 11½ | 12 |
| Rayonier, Inc., pf. | 28 | 27½ | 27⅞ |
| Ruberoid Co. | 22¼ | 21¼ | 22¼ |
| Scott Paper Co. | 39 | 38⅞ | 39 |
| Scott Paper Co., pf. | 114 | 114 | 114 |
| Sutherland Paper Co. | 27½ | 27½ | 27½ |
| Union Bag & Paper Corp. | 9¼ | 8¼ | 9⅛ |
| United Paperboard Co. | 3¾ | 3⅜ | 3¾ |
| U. S. Gypsum Co. | 63 | 61⅜ | 61¾ |
| West Virginia Pulp & Paper Co. | 13¾ | 13 | 13¾ |
| West Virginia Pulp & Paper Co., pf. | 105 | 104¼ | 105 |

BONDS

| | | | |
|---|---|---|---|
| Abitibi Pulp & Paper Co. 5s '53 | 71½ | 71½ | 71½ |
| Celotex Corp. 4½s '47 | 99½ | 98⅛ | 99 |
| Certain-Teed Products Corp. 5½s '48 | 95½ | 93 | 95½ |
| Champion Paper & Fibre Co. 4¼s '50 | .... | .... | .... |
| International Paper Co. 6s '55 | 105¼ | 104⅞ | 104⅞ |
| International Paper Co. 5s '47 | 103¾ | 103⅜ | 103¾ |
| Mead Corp. 3½s '55 | .... | .... | .... |
| West Virginia Pulp & Paper Co. 3s '54 | 104 | 103⅜ | 103⅜ |

### New York Curb Exchange

High, Low and Last for Week Ending January 16, 1943

STOCKS

| | High | Low | Last |
|---|---|---|---|
| American Box Board Co. | 5 | 5 | 5 |
| Brown Co., pf. | .... | .... | .... |
| Great Northern Paper Co. | 29 | 28½ | 29 |
| Hummel-Ross Fibre Corp. | 3⅜ | 3 | 3⅜ |
| National Container Corp. | 9½ | 9⅛ | 9½ |
| St. Regis Paper Co. | 1¾ | 1⅝ | 1¾ |
| St. Regis Paper Co., pf. | 117 | 115 | 115 |
| Taggart Corp. | 4 | 3¾ | 4 |

BONDS

| | | | |
|---|---|---|---|
| American Writing Paper Co. 6s '61 | 90¼ | 88½ | 90¼ |

## No Bond Payment from Abitibi Sale

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., January 18, 1943—It is conceded that there is little likelihood that a further distribution to holders of Abitibi Power and Paper Co.'s 5% bonds will be made as a result of the sale of the company's Espanola mill to the Kalamazoo Vegetable Parchment Company. The price to be paid for the Espanola property has not been officially announced, but most people believe it to be around one million dollars, as stated in this column last week.

The question as to whether or not a distribution can be made will be determined by the Foreign Exchange Control Board policies, which at present, according to spokesmen for the Bondsholders' Protective Committee, would probably not permit any payment. Reason for such action would apparently be that F.E.C.B. will allow only current earnings to be converted into foreign exchange for payment to non-residents. The payment for the Espanola mill, it is suggested, would likely be regarded as a capital payment and would not come under the regulation. Any such action would have to be made through court order and no such application has yet been made.

Under the terms of the deal as announced by Hon. N. O. Hipel, Ontario minister of lands and forests, and G. T. Clarkson, receiver and manager for Abitibi, the purchaser agrees to proceed with rebuilding and extending the mill as soon as priorities can be secured to convert it into a sulphate pulp mill. Expansions of the existing plant, it is claimed, would mean expenditure of several million dollars. It is understood that a condition of the sale was that the Espanola plant would not be used to make newsprint.

The Financial Post is authority for the statement that there are now available perhaps a million dollars from current earning which might be distributed to bondholders without any conflict with F.E.C.B. regulations. This does not include any payment for Espanola, but is the balance of current earnings realized after F.E.C.B. took over control in 1939 and after allowing for the two distributions already made. It is claimed that bondholders are unlikely to ask the courts for permission to distribute so small a sum as a million dollars, preferring to wait until a more substantial amount is available. The two distributions to date have repaid 23% of the principal of the bonds outstanding and have required $11.1 millions.

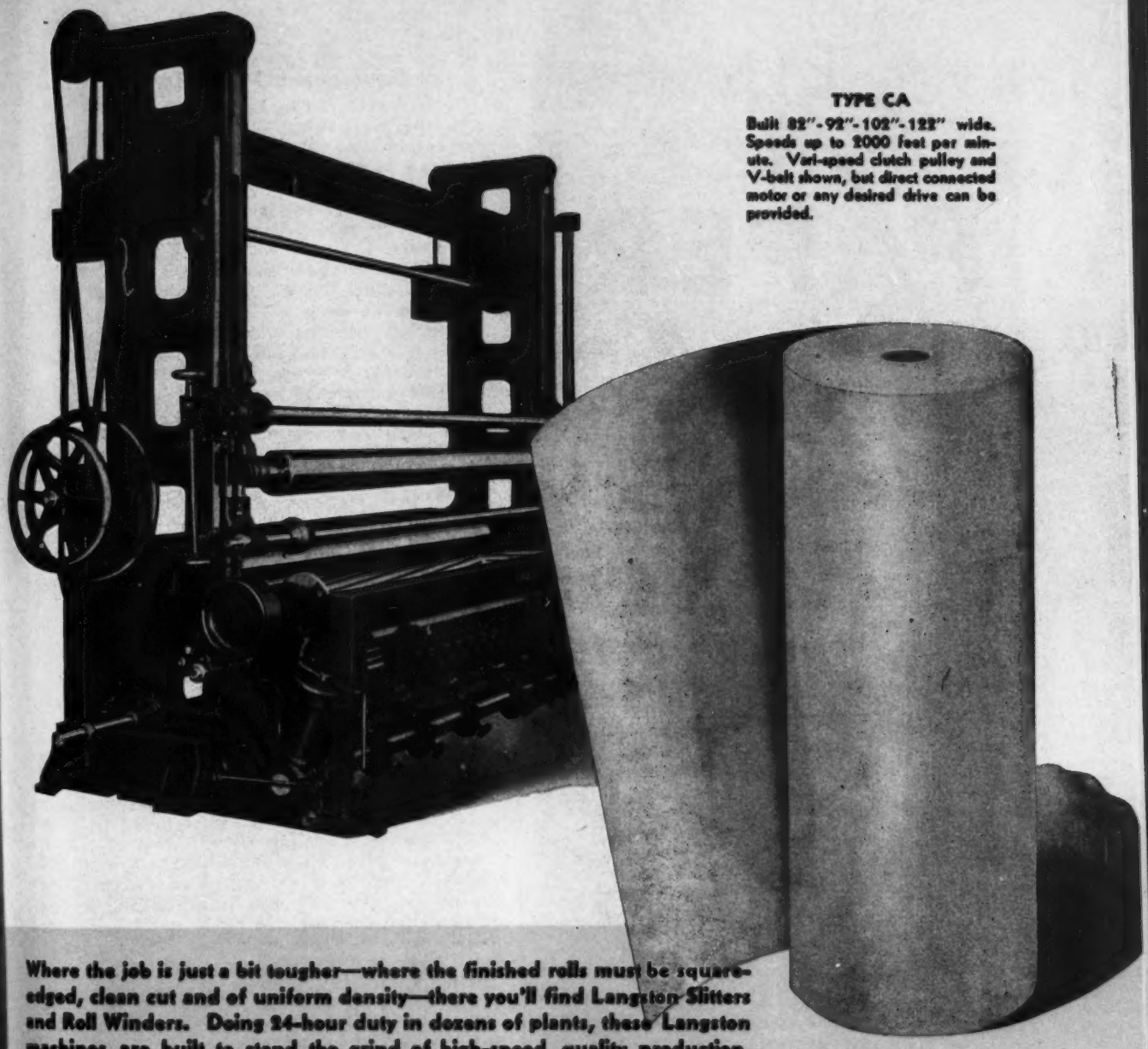
Occasionally one hears talk of Abitibi selling other parts of its assets. The Sturgeon Falls mill would probably be sold if a suitable offer could be obtained. Negotiations for the sale of Kaministiquia Power Company to Hydro-Electric Power Commission of Ontario have been reported, but it is understood no deal is expected in the near future.

## Celotex to Acquire Stock

The Celotex Corporation held its yearly meeting of stockholders on January 19. Bror Dahlberg, president, received $71,200 and was paid by the Certain-Teed Products Corporation and its subsidiary, Sloane-Blabon Corporation, $60,716, and is also entitled to profit sharing compensation estimated at $79,786. Celotex proposes to acquire from the Phoenix Securities Corporation 93,100 shares, or 27%, of the South Construction Corporation's common stock. Celotex now owns 8% of the common and 74% of the preferred.

## Masonite Earns 37 Cents

The Masonite Corporation for the quarter to November 30, reports a net profit of $346,584, equal to 57 cents each on 539,210 shares of common stock after preferred dividend requirements; sales totaled $4,693,432.



**TYPE CA**

**Built 82"-92"-102"-122" wide. Speeds up to 2000 feet per minute. Vari-speed clutch pulley and V-belt shown, but direct connected motor or any desired drive can be provided.**

**Where the job is just a bit tougher—where the finished rolls must be square-edged, clean cut and of uniform density—there you'll find Langston Slitters and Roll Winders. Doing 24-hour duty in dozens of plants, these Langston machines are built to stand the grind of high-speed, quality production. For every grade of paper, for wide or narrow cuts, small or large diameters, there is a type and size to meet your needs.**

★ ★ *rolls well-wound, of compact weight travel better and save on freight* ★ ★

**SAMUEL M. LANGSTON COMPANY**
**CAMDEN, NEW JERSEY**

# *Langston*
# SLITTERS & ROLL WINDERS

## Government Paper Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., January 20, 1943—The Government Printing Office has announced the following paper awards: R. P. Andrews Paper Company will furnish 43,110 pounds of 50% rag yellow index paper at 10.9 cents per pound; 194,000 pounds of 50% rag white index paper at 10.9 cents per pound; and 43,100 pounds of 50% rag pink index paper at 10.9 cents per pound.

Bulkley, Dunton & Co. will furnish 19,000 sheets of Plymouth Duplicator Bond Paper at 11.25 cents per pound; Walker-Goulard Plehn Company will furnish 400,000 pounds of No. 2 offset poster paper at 7.566 cents per pound; Marquette Paper Company will furnish 237,160 pounds of white coated book paper at 9.15 cents per pound; Walker-Goulard Plehn Company will furnish 22,879 pounds of white coated book paper at 9.14 cents per pound; Marquette Paper Company will furnish 600,000 pounds of poster paper at 8 cents per pound; R. P. Andrews Paper Company will furnish 176,750 pounds of buff wood bristol board at 6.34 cents per pound; Barton, Duer & Koch Paper Company will furnish 100,000 pounds of white machine coated book paper at 4.65 cents per pound.

George LaMonte & Son will furnish 14,526 pounds of sensicoat postal card paper at 29.5 cents per pound; Mudge Paper Company will furnish 19,200 pounds of 25% rag white ledger paper at 10.92 cents per pound; R. P. Andrews Paper Company will furnish 112,000 pounds of white sulphite manifold paper at $9.00 per cwt.; also the latter will furnish 35,000 pounds of chemical wood manila paper at $7.65 per cwt.; Barton, Duer & Koch Paper Company will furnish 5,080 sheets of white cloth lined cover stock at $225.00 per M; also 6,050 sheets of black bookbinder board at 6 cents per pound; Marquette Paper Company will furnish 96,000 pounds of white sulphite index paper at 7 cents per pound; Barton, Duer & Koch Paper Company will furnish 261,322 pounds of white sulphite manifold paper at 8.4 cents per pound; and also 99,886 pounds of 50% rag white index paper at 10.69 cents per pound.

R. P. Andrews Paper Company will furnish 20,000 pounds of tan rope (bristol paper) at 10.1 cents per pound; also 20,000 pounds of tan bristol (rope) at 10.1 cents per pound; 32,600 pounds of tan bristol board at 10.1 cents per pound; 25,000 pounds of tan bristol cover paper at 10 cents per pound; and 25,000 pounds of tan bristol cover paper at 10 cents per pound.

Walker-Goulard-Plehn Company will furnish 177,600 pounds of telephone book news at 3.36 cents per pound; Barton, Duer & Koch Paper Company will furnish 600,000 pounds of white machine coated book paper at $4.65 per cwt.; Bulkley, Dunton & Co. will furnish 17,300 pounds of 50% rag yellow manifold paper at 19.2 cents per pound; also 5,176 pounds of white 25% rag ledger paper at 12.35 cents per pound; and 12,600 pounds of 25% rag white bond paper at 11.35 cents per pound.

Paper Corporation of US will furnish 10,080 pounds of 25% rag yellow bond paper at 11.5 cents per pound; R. P. Andrews Paper Company will furnish 40,000 pounds of tan rope bristol cover paper at $10.25 per cwt.; Stanford Paper Company will furnish 35,620 pounds of cover paper "whitag" semi antique finish for $3,633.23; and Walker-Goulard-

Plehn Company will furnish 65,000 pounds of white bond paper at 10.25 cents per pound.

Wilcox-Walter-Furlong Paper Company will furnish 1,250,000 pounds of chemical wood manila paper at 4.18 cents per pound; 40,000 pounds of oiled manila tympan paper at $8.25 per pound; D. L. Ward Company will furnish 32,448 pounds of white sulphite bond paper at 6.65 cents per pound; Butler Company will furnish 80,000 pounds of white chemical wood bond paper at 6.95 cents per pound; and Marquette Paper Company will furnish 12,500 pounds of 50% rag pink manifold paper.

## Sandy Hill Gets Renewal Star

HUDSON FALLS, N. Y., January 18, 1943 — More than five hundred employees of The Sandy Hill Iron and Brass Works, paper and pulp mill machinery manufacturers, were in attendance at the company's annual banquet when the U. S. Navy six-months' renewal star was presented to the company for continued proficient production for the Navy. The star now appears on the Navy "E" burgee, which floats over the busy Hudson Falls plant, working 168 hours a week on navy production.

Presentation of the new flag with the star was made by Captain J. S. Evans, representing the Navy in this district, and it was formally received by Dr. R. C. Tefft, Jr., for the company. President Frank A. Juckett gave the welcome address.

Another feature of the program was the presentation of a pin representing the new employees, which was received on behalf of the employees by Miss Martha Filkins, who has been connected with the Sandy Hill Iron and Brass Works for over 40 years. William M. Leeson presented pins to employees with service of over 10 years with Sandy Hill. The company has 15 employees with over 25 years of continuous employment, and 22 who have been over 10 years in its service.

Lieutenant J. Walter Juckett, secretary and assistant treasurer of Sandy Hill, returned from active duty with the Army to act as master of ceremonies at the dinner, and to formally receive a service flag in behalf of the forty-four employees who are in the Army, Navy and Marine Corps.

Members of the A. A. Johnson Organization also attended the dinner, and were given a special welcome by the toastmaster. Through arrangement with this concern the Sandy Hill Iron and Brass Works is producing the famous Johnson automatic towing winches which are finding great and successful use by the Navy in all the seven seas.

A program of entertainment was given by Sandy Hill Sons and Daughters, and there were songs by John Seagle.

The Sandy Hill Iron and Brass Works is one of the few industrial concerns in this section to have been awarded the Navy "E" flag. It was presented by Admiral H. A. Wiley, U.S.N. Retired, Chairman of the Navy Board for Production, on May 8, 1942.

## N. W. Wilson on Advisory Board

ERIE, Pa., January 18, 1942—Norman W. Wilson, president of Hammermill Paper Company, has been selected to the pulp and paper industry advisory committee of the war production board, it was announced last week. The local paper plant executive, it was learned, has accepted the appointment.

*Longcrimp Fourdrinier wire cloth, 30 times "up"*

There can be no paper quality without wire cloth quality. The paper-forming process depends for its success upon the quality of the body mesh. Contributing factors are weave pattern, selvedge, seam, and the metal itself. It is on the bed of warp and shute knuckles pictured above that the slurry of interwoven fibres comes finally to rest.

Wire cloth today is tailored to the machine and the paper produced. Uniformity of mesh is paramount to paper excellence. At Lindsay, "uniformity" covers mesh opening, wire size, cloth thickness and firmness, knuckle height and shape, resistance to corrosion, abrasion and fatigue, and other points. We consider such many-sided uniformity a *fundamental* in filling your specifications.

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FOR PAPER MILLS

# CONSTRUCTION NEWS

*Under limitations order L-41 all projects involving expenditures of more than $5,000 must be specifically approved by the War Productions Board. The status of projects reported herewith under the provisions of the order is not known.*—EDITOR.

**Niles, Ohio**—The National Gypsum Company, 325 Delaware avenue, Buffalo, N. Y., manufacturer of wall board, insulating board, etc., has plans under way for new addition to branch mill on Walnut street, Niles, to be used for expansion in main production department. No estimate of cost has been announced. Work is scheduled to begin at early date.

**St. Paul, Minn.** — The Minnesota Mining and Manufacturing Company, 900 Fauquier avenue, manufacturer of sand paper and other abrasive paper stocks, has approved plans for expansion at mill, including installation of additional equipment. Latter will include about 40 new electric motors, each approximately 170-horsepower rating, with controls and auxiliary equipment. Work will be carried out under direction of E. M. Johnson, vice-president and chief engineer, and will be placed in progress at once.

**Painesville, Ohio** — Industrial Rayon Corporation, West 98th street and Walford avenue, Cleveland, Ohio, manufacturer of cellulose rayon products, is replacing production of regular type rayon material at mill at Painesville, with high tenacity material suitable for tire service. Large production will be carried out. It is understood that the output will be used by the Government.

**Toledo, Ohio**—The State Iron and Metal Company, 632 East Woodruff avenue, waste paper products, metals, etc., plans early rebuilding of paper storage and distributing building recently damaged by fire. An official estimate of loss has not been announced.

**Milwaukee, Wis.** — The Chase Bag Company, 302 East Pittsburgh avenue, manufacturer of paper bags and containers, has work under way on improvements in building at location noted, previously referred to in these columns, and will push project to early completion. H. Schmitt & Son, Inc., 930 East Burleigh street, Milwaukee, is general contractor.

**Metuchen, N. J.** — The Celotex Corporation, manufacturer of wall board, insulating board, etc., is running on a capacity schedule at its branch mill at Metuchen, giving employment to large working force. Majority of output, it is said, is for Government service. It is expected to hold to present production basis for an indefinite period. Main offices of company are at Chicago, Ill.

**Delaware, Ohio**—Hinde and Dauch Paper Company, Inc., Sandusky, Ohio, manufacturer of paper boxes and containers, has perfected a new type of L-shaped corrugated container, designed particularly for chair packing and distribution. The design of the container makes possible the "nesting" of contents to a point where 30 per cent more chairs can be shipped by motor truck or freight cars in a single load, at the same time providing better protection. The new containers will be used by Sam Moore Chairs, Inc., Delaware. It is said that large production will be carried out at company converting plant for the new package.

**St. Louis, Mo.**—The building occupied by Eliot Wallpaper Mill, Inc., 2605 Cass avenue, St. Louis, manufacturer of wall paper stocks, recently damaged by fire, as recently referred to in these columns, was secured under lease from the Vittert Building Company, St. Louis, which is said to be arranging to rebuild the structure at early date. The fire loss aggregated about $35,000, including building, equipment and stock.

**Rhinelander, Wis.** — The Rhinelander Paper Company, manufacturer of glassine, greaseproof and other processed paper stocks, has superstructure under way for new addition, previously noted in these columns, and will have structure ready for service at early date, and will be used primarily for storage and distribution. No estimate of cost has been announced. Work is being carried out by day labor.

## Drug Trade to Conserve Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., January 20, 1943—Recommendations for conserving paper were made by members of the Proprietary Drugs Industry Advisory Committee at a recent meeting in Washington.

Industry members recommended asking all customers to accept drug products over the counter without additional wrappings other than the cartons the products came in originally. This would result in a large saving of kraft paper, it is believed.

Elimination of all folders other than the one wrapped with the package also was recommended. The size of this folder would be limited to the present size of the main direction folder.

Where drugs are packed in cartons using a carton liner between the bottles and the carton, the committee recommended that such packing should not require further liners or partitions.

Shipping cases carrying incoming supplies should be used again for outgoing shipments wherever possible, they suggested.

Members recommended that "packers," which are used to package cartons of bottled medicines, be made of whatever form of chip board requires the least virgin pulp.

The recommendations were made following detailed discussion of the report of a sub-committee appointed to study conservation measures.

## Robert Englander Joins Navy

Federated Mills, manufacturers of 100% Solka Cleansing Tissues, announces that Robert Englander, partner and production manager, has taken a leave of absence to join the United States Navy. Mr. Englander has been commissioned an ensign in the United States Naval Reserves.

# Obituary

### William R. Thomas

William Russell Thomas, retired chief engineer of E. D. Jones & Sons Co., Pittsfield, Mass., manufacturers of papermill machinery, died here Friday night. He was seventy-seven years old.

He was born at Laconia, N. H., and was graduated from Massachusetts Institute of Technology as a mechanical engineer in the class of 1887. He was with the Jones company forty-seven years and designed paper mills for foreign governments including China and Japan. Mr. Thomas was a founder of First Church of Christ, Scientist, Pittsfield, and had served as its clerk and a director. His wife and one sister, Mrs. George R. Todd, of Boston, survive.

### Mrs. Harriet Clark

Mrs. Harriet (Smith) Clark, 72, wife of Alvan S. Clark, paper mill machinery manufacturer, Holyoke, Mass., died suddenly last week in her home, 79 Merrick avenue, from a heart attack.

Mrs. Clark was a member of the First Baptist Church, the Woman's Guild and Group B of that church and the auxiliary of the Railroad Engineers.

Surviving her besides her husband are one brother, Charles Smith of Longmeadow; six grandchildren and several nieces and nephews. Funeral services were held at the First Baptist Church and burial was in Oak Grove Cemetery, Springfield.

### Jim Coy, Jr.

Friends of James "Jim" Coy, vice president of the Flam-Beau Paper Company, head of its Chicago sales offices, are sympathizing with him in the death of his son, Jim, Jr., who was killed in an automobile accident on January 14. The accident occurred in Waterbury, Conn., while Jim, Jr., was attending to business matters for the Cherry River Paper Company for which he had served as a food packaging expert for many years. Jim, Jr., 34 years old, was widely known to Chicago paper salesmen and paper buyers having begun his active experience first with his father and shortly after with the Cherry River Paper Company. He left that city about eight years ago and was doing an exceptionally fine job in his eastern connection until his untimely death. He leaves a widow, Winifred, a former resident of LaGrange. Mr. Coy, senior, and Mrs. Coy left for Haverford on Friday afternoon, January 15. Services were held in that city on January 17. The final decision as to interment has not as yet been made.

### Arthur R. Martin

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., January 18, 1943—Arthur R. Martin, president of the Bradner Smith Paper Company, died in his home on January 1 with funeral services held on January 5. Mr. Martin had been identified with the Chicago paper jobbing firm for over twenty years and had been president of the company for the past three. He is survived by his widow and one son. No later announcements have been made as to organization re-arrangements within the Bradner Smith Company.

## B & W Refractories Gets Army-Navy "E"

On December 24, 1942, the Honorable James Forrestal, Under Secretary of the Navy, wrote A. G. Pratt, president of The Babcock and Wilcox Company, that the company's works in Augusta, Ga., had been awarded the Army-Navy "E" for outstanding production of refractories.

Previously, B & W's Barberton (Ohio) Works received the Navy "E", the Maritime "M" and the Army-Navy "E".

The award ceremonies at the Augusta Works will be held in Augusta on Friday, January 22, 1943. Rear Admiral Clark Howell Woodward, U.S. (Retired), Chief of the Incentive Division of the Navy, will officially present the "E" pennant to A. G. Pratt, president of the company. Col. Herbert W. Schmid, U.S.A., Commanding Officer of Camp Gordon, Ga., will present the "E" pins to employees representing the plant personnel. The Honorable W. D. Page, mayor of the city of Augusta, will act as master of ceremonies.

Governor Ellis Arnall, of Georgia, Senator Walter F. George, Senator Richard B. Russell, Congressman Paul Brown, and Congressman Carl Vinson are among the celebrities who have been invited to attend the ceremonies.

## Boston Representatives in War Work

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., January 18, 1943—John F. Blackman, of D. F. Munroe Company, has been appointed chairman of the Paper and Paper Products Division of the Greater Boston United War Fund Drive. Vice-Chairmen named are: Frank H. Winter, Carter, Rice & Co., Corporation; Samuel S. Talbot, Storrs & Bement Company; Hubert W. Lockhart, Von Olkner-Snell Paper Company; Louis Bills, Robbins Paper Company; Willard H. Loud, Stimpson, Inc., and Henry Nadell, Ginsburg Brothers, Inc.

BOSTON, Mass., January 18, 1943—The following four employees of Carter Rice & Co., Corporation, have recently joined the forces of the United States: Misses Genevieve G. Mulligan and Carolyn R. Low, WAVES; Thomas F. Harvey, Army Air Corps, and Ethan Allen, Army Signal Corps.

John P. Begley, a paper broker, Needham, Mass., has joined the U. S. armed forces.

## Publishers' Newsprint Quota Set

MONTREAL, Que., January 18, 1943 — Following last week's announcement of specific production schedules for the various newsprint mills in Canada, the Government authorities have now notified individual newspapers in the Dominion of the tonnage they are allowed to buy under the new regulations and has issued the requisite permits. This has come after careful consideration of the returns filed by the newspapers regarding their methods of sale and distribution, their use of paper and their circulation changes. Most newspapers have for some time past put measures for conservation in the use of newsprint into force, by publishing smaller issues and tightening up generally, and under present regulations, so long as they last, there will be no great hardships involved in the reduced supplies now available.

# PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

Henry J. Berger
EDITOR

Vol. 116 January 21, 1943 No. 3


## COMING EVENTS IN PAPER INDUSTRY

American Paper and Pulp Association, Sixty-sixth Annual Convention and meeting, Waldorf-Astoria Hotel, New York, February 15-19.

Technical Association of the Pulp and Paper Industry, Convention, Commodore Hotel, New York, February 15-18.

National Paper Trade Association of the United States, Convention, Waldorf-Astoria Hotel, New York, February 15-18.

Salesmen's Association of the Paper Industry, Annual Meeting and Luncheon, Waldorf-Astoria Hotel, New York, Tuesday, February 16.

The New York Association Of Dealers In Paper Mills' Supplies, Annual Banquet, Commodore Hotel, New York, Tuesday, February 16.

Paper Club of New York, Annual Dinner and Entertainment, Waldorf-Astoria Hotel, New York, Wednesday, February 17.

Canadian Pulp and Paper Association, Thirteenth Annual Meeting, Mount Royal Hotel, Montreal, Que., Canada, January 27, 28 and 29.

New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

Delaware Valley Section. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

## INVENTORY CONTROL

Strict government regulation of the diminishing supply of a wide variety of goods for civilian consumption will become effective in the second quarter of this year. This is provided for in the inventory control method in Limitation Order L-219, which was issued December 29, 1942, by Ernest Kanzler, Director General for Operations, War Production Board. This order is a mercantile control measure only, as manufacturers and their products subject to government regulation, are covered in other orders issued by the War Production Board. The War Production Board, of which Lorin W. Smith, Jr., is head of the Campaigns and Media Branch of the Division of Information, is to be commended for the preliminary steps taken in explaining the details of Order L-219, at a meeting held in New York last week, attended by the trade press and executives in various major fields.

Limitation Order L-219, as explained by the War Production Board, is needed to speed up the war program by preventing merchants from piling up excessive stocks in relation to the total available supply of goods. By reducing pressure to produce more and more consumer's goods; by releasing excess inventory; by releasing manpower used in warehousing excessive inventory; by delaying exhaustion of scarce materials, and by helping to maintain civilian morale. This inventory limitation applies to merchants who are engaged in wholesaling, jobbing, retailing, marketing consumers' goods and who maintain a mercantile inventory. Order L-219 is, therefore, a consumers' goods inventory and requires controlled merchants to restrict their receipts of consumers' goods when their inventories are larger in proportion to sales, than their base period inventories. A controlled merchant is a wholesaler, retailer or manufacturer with stock-carrying branches, who had a mercantile inventory with a cost value of $50,000 or more, on or after November 30, 1942, at the end of any quarter of his federal income tax year; and also net sales of consumers' goods of $200,000 or more during the twelve months preceding the end of the same quarter of his federal income tax year. Paper and paper products, stationery, books, giftwares and many other kinds of consumers' goods are included. The order becomes effective at the beginning of a merchant's second quarter of 1943; on March 1, if the inventory began December 1; on April 1, if the inventory began January 1, and on May 1, 1943, if the inventory begins February 1. Merchants are required to make quarterly reports and send them to WPB, not later than the 25th of the month of the second quarter of 1943.

In summarizing the procedure, the WPB points out that all marketers of consumers' goods who did a business of $200,000 in the inventory year of 1942 and who had inventories of $50,000 on the last day of that year are subject to this order. Merchants doing more than 50% of their volume in goods on list A, are exempt from the order. The merchant who finds himself included must compute the relationship between inventory and sales during 1939, 1940 and 1941, which is the basis on which his normal inventory is calculated. If a merchant after figuring out his inventory ratio, finds he has more than a normal, or average, inventory, after taking into account the "tolerance" allowed him, must make a report to Washington and his purchases for that quarter will be restricted. If his inventory, based on the three-year average, is normal he need make no report and may purchase his second quarter's merchandise when he chooses. As a controlling factor to aid in keeping inventories down, his sales of the second quarter of 1943, compared with the sales of the second quarter of 1942, determine the amount he will be allowed to purchase in the fourth quarter, the holiday buying season. It works like this, the WPB explains: The merchant determines (1) if more than 50% of his business is done in commodities on the A list. If so, he is exempt. (2) If not, was his inventory at the end of any quarter of the tax year $50,000 or more, at cost, on or after November 30, 1942; and were the yearly sales $200,000 or more during the twelve months preceding the end of such quarter? (3) What was his stock-to-sale ratio by quarters over the base period years, 1939, 1940, 1941? (4) What is his current rate of sales as com-

pared with the same period last year? (It is on that he bases his normal inventory for the future.) (5) What is his normal inventory? (6) Is the actual inventory, at the start of the second quarter, below his "inventory limit"? If so, he need not file a report with WPB. (7) If his actual inventory is over his inventory limit (the inventory limit is equal to the normal inventory plus the tolerance allowed) what is his "open to buy"? (allowable receipts, based on projected sales). And from there on, states the WPB, his job is simple. He files reports monthly with WPB until his inventory is below his inventory limit and during that period his intake of merchandise is restricted to his "allowable receipts."

Building of large inventories against uncertain supply, explains the WPB, is an accepted practice in peace time, but it won't work in a nation at war. . . . The order is designed to cut off the normal human urge to stock up on scarce commodities. . . . It should play a part in heading off any trend toward post-war inflation by curbing the "large inventory" psychology. There has been considerable voluntary cooperation, as large retailers began to realize they were hurting their own long-range self interest by piling up too large inventories. Nobody knows what technological advances will come out of the war—what will be out-moded, what will not. . . . The new order will be administered by Eaton V. W. Read, chief of the wholesale and retail policy section of the Office of Civilian Supply, assisted by Harry D. Wolfe, of the committee's technical staff.

## Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

| Current Weeks—1942 | | Corresponding Weeks—1941 | |
|---|---|---|---|
| December 5 | 85.0 | December 6 | 106.9 |
| December 12 | 86.7 | December 13 | 106.3 |
| December 19 | 86.8 | December 20 | 107.3 |
| Dec. 26 (Revised) Holiday Week | 62.3 | December 27 | 79.3 |
| January 2, '43 | 73.6 | January 3, '42 | 102.2 |
| January 9....Preliminary | *86.8* | January 10 | 103.5 |

COMPARATIVE MONTHLY SUMMARIES

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July |
|---|---|---|---|---|---|---|---|
| 1941 | 85.6 | 89.7 | 92.2 | 96.0 | 98.7 | 99.3 | 94.2 |
| 1942 | 104.5 | 103.9 | 102.9 | 100.4 | 95.3 | 87.4 | 75.8 |

| Year | Aug. | Sept. | Oct. | Nov. | Dec. | Year Avg. |
|---|---|---|---|---|---|---|
| 1941 | 101.0 | 99.7 | 105.2 | 106.2 | 100.4 | 97.4 |
| 1942 | 80.8 | 82.9 | 90.7 | 86.8 | *79.3* | *90.5* |

COMPARATIVE YEARLY SUMMARIES

| | 1935 | 1936 | 1937 | 1938 | 1939 | 1940 | 1941 | 1942 |
|---|---|---|---|---|---|---|---|---|
| Year Average | 69.9 | 80.4 | 79.8 | 71.5 | 83.4 | 85.6 | 97.4 | *90.5* |

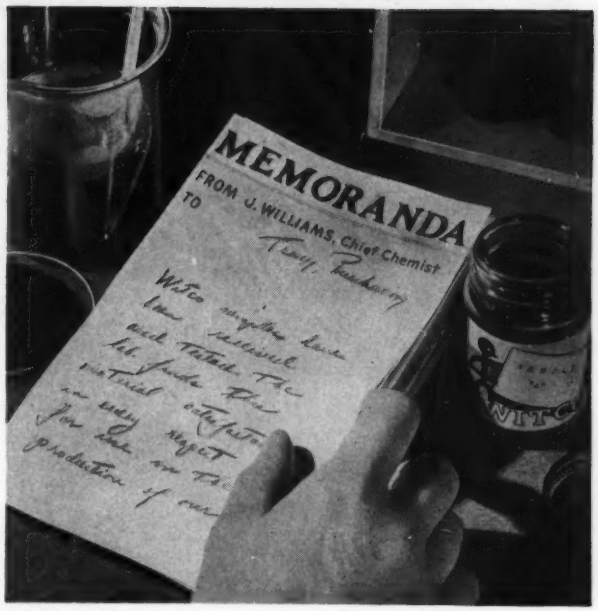
* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1937 | 83 | 89 | 89 | 91 | 88 | 80 | 69 | 77 | 72 | 70 | 57 | 47 | 73 |
| 1938 | 56 | 63 | 63 | 60 | 60 | 59 | 59 | 60 | 70 | 73 | 67 | 61 | 64 |
| 1939 | 65 | 73 | 76 | 74 | 69 | 73 | 68 | 77 | 82 | 91 | 88 | 77 | 77 |
| 1940 | 78 | 75 | 74 | 76 | 82 | 85 | 77 | 79 | 78 | 85 | 82 | 77 | 78 |
| 1941 | 81 | 88 | 89 | 89 | 91 | 94 | 92 | 98 | 95 | 99 | 98 | 90 | 92 |
| 1942 | 102 | 101 | 101 | 95 | 82 | 72 | 68 | 75 | 76 | 81 | 82 | 77 | *84* |

Week ending Dec. 5, 1942—82
Week ending Dec. 12, 1942—84
Week ending Dec. 19, 1942—85
Week ending Dec. 26, 1942—72
Week ending Jan. 2, 1943—62
Week ending Jan. 9, 1943—*82*

† Per cent of operation based on "Inch-Hours" reported to the National Paperboard Assn.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Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY
Edited by R. G. Macdonald, Secretary

# Graphic Arts Committee Report—1942*

By M. S. Kantrowitz[1]

This report covers the work of the Graphic Arts Committee of the Technical Association of the Pulp and Paper Industry for the year 1942.

### Committee Membership

During the year F. D. Elliott of Michigan Research Laboratories, Inc. was appointed to membership in the committee. All members who served last year on the committee indicated their desire to continue their membership.

### Status of Current Projects

The effort of the Graphic Arts Committee during the year was devoted almost entirely to methods designed to more definitely correlate the physical characteristics of paper with its printing qualities. Until recent years most of the research work directed toward paper testing was concerned with those properties of paper which are of much more importance to the paper maker than to the paper user. Among such research may be included the composition of fibers, weight, folding endurance, bursting strength, tensile strength, resistance to tear, acidity and rosin content. All of these tests are confined to the physical composition and strength of the paper. While they all give useful information to the paper maker, almost none has a very direct bearing upon the paper's printing qualities.

The new demands which modern printing is making upon paper now leads to many considerations dependent upon quite other properties and functions which, as far as paper testing is concerned, have been entirely or almost entirely neglected. In the group of paper characteristics most important to printing may be classified surface finish, covering smoothness or roughness, porosity measured by permeability to air, ink receptivity measured by oil penetration and absorption, surface strength or resistance to fluffing and picking, formation, opacity, softness or compressibility, expansion and contraction with atmospheric influences and moisture content.

The need for dependable instruments and methods for accurately measuring these important printing properties of paper has long been felt by both manufacturers and printers. If uniformity of printing qualities is to be maintained in the manufacture of any kind of paper, laboratory methods of paper testing must be developed to reasonably predict its performance in any kind of printing before the paper reaches the presses.

Three such methods namely, Surface Strength, Porosity or Resistance to Air Flow, and Printing Opacity which were promulgated by this Committee last year have now been submitted to the Paper Testing Committee of TAPPI for their consideration and approval. One method, "Castor Oil Test for Printing Oil Permeation of Paper" promulgated this year by this committee has also been referred to the Paper Testing Committee. A method for determining the smoothness of paper is presently being written by the Subcommittee on Testing Methods.

#### Surface Strength

This method was adopted by TAPPI and published in the October 22, 1942 issue of the *Paper Trade Journal* as a Tentative Standard T 459 m-42 under the title "Wax Test for Surface Strength of Paper". Constructive suggestions have been received leading toward improvement of the method.

The following comments were made by members of this committee:

1. The method should contain a critical description of the waxes.
2. Waxes should be defined.
3. Is there any method for calibrating the various waxes—i.e., ensuring that their adhesion does not vary with time, or that subsequent sticks of the same serial number have the same adhesion as those first supplied?
4. The method should be more definite as to:
   a. Temperature and method of melting.
   b. Pressure of melted wax on paper.
   c. Method of pulling wax from paper.

The Chairman has written under date of June 9, 1942 to Dennison Manufacturing Company, manufacturer of the waxes, for information in order to clarify these four items.

Replying under date of June 25, 1942, the Dennison Manufacturing Company stated:

"Some students as a thesis studied the effect of variations in temperature of application on the critical wax numbers and after thousands of readings by means of a thermocouple junction concluded that an operator using the technique recommended in this method would reproduce his results consistently. Likewise thousands of actual tests have indicated that it is necessary to clearly violate the accepted technique of applying or removing the waxes to change the significant wax number obtained on a given sheet.

"If you are to give a critical description or definition of the waxes beyond that given in the method you would either have to specify outright one product such as "Dennison standard paper testing waxes", give the exact composition of each grade or work out a calibration method reproducible in any commercial laboratory in a reasonable time.

"We have, after much time and effort, collected many surfaces of each hardness represented in this series of waxes. Due to the small area of many of these we have a regular problem of replenishing our supply. Each new batch is checked against standard waxes as well as standard surfaces. At least three surfaces are required to assure a match.

"These waxes have been made and used widely for many years with little question as to reproducability, either in manufacture or application, but the question has been raised as to whether the results obtained are an absolute measure of surface strength as the wording of your method may lead some to believe. They give relative measurements in that any increase in size content of a coating reflects directly in the wax number and likewise processing changes in an uncoated sheet such as increased beating, calendering, sizing, etc. influence the wax test just as it does the printability of the sheet. What confuses people is that the critical wax required for satisfactory performance of a casein coated sheet may be 6 while an uncoated sheet on the same job may require a 12 wax and a lacquer coated

* To be presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 15-18, 1943.

[1] Member TAPPI; Chairman of TAPPI Graphic Arts Committee; Technical Director of U. S. Government Printing Office, Washington, D. C.

sheet a 20 wax. Once the requirements for each type of sheet are arrived at, however, the wax test will permit you to select the proper surface strength of any other lots of any of these types for this particular job."

There follows a brief discussion of the significance of the pick test for determining the surface strength of paper.

The surface strength of paper is the resistance of paper to removal of coating or fibers or to cleavage parallel to the sheet direction.

Paper is said to pick when coating, fibers, or small portions of the paper itself, separate from the body of the sheet while it is being printed. Coated paper picks due to the fact that the adhesive affinity of the ink for the coating is greater than the adhesive affinity of the coating for the paper, or because there is insufficient bonding strength in the base stock to prevent its splitting.

The Dennison Manufacturing Company developed a series of waxes designed to measure surface strength. The wax test consists of melting the tips of the wax sticks and then placing them on the surface of the paper to be tested. The waxes have graded adhesive powers so that when the waxes have cooled and are pulled from the sheet there is an increase in amount of pull administered to the surface fibers and coating.

The results of the wax test are expressed as a numerical rating of pick corresponding to the highest number of the wax in the series which fails to disturb the surface of the paper.

Paper picking during printing leaves small white spots on the printed image and is especially noticeable in solid areas. The particles lifted from the sheet may lodge on the printing plate or to be carried back through the inking system of the press. If there is much picking, it necessitates frequent washups of the plates and even the rollers and the ink fountains. Picking also clogs type and halftones, producing mussy printing.

While surface strength is an empirical property depending considerably upon conditions of manufacture, it also defines utilitarian characteristics associated with printing. This test has become a matter of importance since the development of multicolor printing and the speeding up of equipment.

It is realized that the wax pick test does not fall in the category of a precise test, but since it is used in Government specifications and elsewhere, it is considered desirable to have a TAPPI method for making this test. According to the experience of a number of printers it proves very satisfactory in specifications where a minimum requirement is specified.

Despite its limitations the method is useful in that it will indicate which of two papers will have a more likely tendency to pick if printed with the same ink under identical press conditions. It is also of value to determine whether any picking which has occurred is due to faulty paper or to some other condition of printing.

A revised proposed tentative method for wax pick test for surface strength of paper is being prepared based upon all available information obtained from existing literature on the subject, from information received from Dennison Manufacturing Company, comments made by members of the Graphic Arts Committee, members of the Paper Testing Committee and other members of TAPPI.

### Porosity or Resistance to Air Flow

This method has been subjected to considerable criticism and a revised method is being prepared for resubmission to the Paper Testing Committee.

### Printing Opacity

As stated earlier in this report a method for determining printing opacity has been submitted by this committee to the Paper Testing Committee for consideration of adoption. There appears to be a difference of opinion among members of TAPPI as to the need of a method for measuring printing opacity. Some members contend, as does the chairman of the Graphic Arts Committee that "printing opacity" not only has all the advantages of the contrast ratio method, but it even more closely approximates the practical conditions under which the printed sheet is usually observed. In the case of "contrast ratio" capacity the discrepancies in results seem to be due to several factors of which probably the most important are the nonlinearity of photocell response and the difficulty of maintaining the standard white background specified by the contrast ratio method. In the case of "printing opacity" the same factors apply with the exception that the standard white background is eliminated. Thus printing opacity removes one important possible variable.

Objections to printing opacity are due to claims that there are sources of error in the direct measurement of printing opacity not present in contrast ratio opacity. One of these it is asserted arises from the greater difficulty of keeping the specimen under test flat when it is backed by a thick stack of similar specimens and at the same time maintaining sufficient pressure to yield a reproducible backing. Another arises whenever the specimen is small so that the question of getting enough layers to form an opaque backing becomes important.

In view of the varying opinions it is recommended that further instrumentation work be done on the subject of opacity measurements.

### Ink Receptivity

Ink receptivity of paper may be measured either as the time necessary for the vehicle oil to penetrate from one side of the sheet to the other, or as the time necessary for initial absorption of a thin film of a certain oil simulating the ink vehicle oil applied to the surface of the sheet. The first method is suitable for absorbent papers. The second method was proposed for heavy printing or coated papers where absorption of the ink or oil is chiefly on the surface. These papers because of thickness or nonuniformity in the construction of the sheet, as in coated papers, or board, do not give satisfactory results when tested for rate of oil penetration.

Methods for measuring "Oil Penetration of Paper" and "Oil Absorption of Paper" were reported by the Graphic Arts Committee to the Paper Testing Committee. Both of these methods were approved for adoption, but on further consideration it was decided they should be returned to the Graphic Arts Committee for further study. After considerable deliberation the oil penetration method was revised and resubmitted under the title "Castor Oil Test for Printing Oil Permeation of Paper" to the Paper Testing Committee for adoption. The "oil absorption" method was retained in the Graphic Arts Committee for further study because it does not appear to have sufficiently good reproducibility for general use.

The oil penetration of absorbent papers is determined by the "oil drop" method, which measures the time in seconds at which a drop of C.P. castor oil pro-

duces a uniform translucent spot through the test specimen.

Castor oil is used as the standard liquid medium in this test, because the use of printing ink itself for measuring penetrability would involve difficulty in securing and maintaining standard ink for the purpose. Furthermore the variation in printing inks required to suit various kinds of paper and the wide variety of printing inks offered for the same class of printing would preclude accurate comparison of test results obtained with any single standard ink with those actually obtained on the press. The instability of printing ink is another deterrent factor in its use for this purpose due to the changes occurring in the characteristics of an ink after manufacture caused by chemical and physical reactions between the various components. Another objection to the use of one standard ink lies in the difficulty of accurately measuring test quantities and of securing a satisfactory end point for complete penetration. On the other hand, castor oil, which has characteristics similar to ordinary ink vehicles, may be obtained in standard quality and does not change with aging through oxidation or other atmospheric influences.

Although the determination of the ink receptivity of papers by oil penetration is expressed by a definite number, the results, as in the case of the wax pick test, are empirical and measure only one of the properties defining the printing qualities of paper. The chosen conditions for making the test, and the effect of the personal equation in determining the end point, influence the numerical values obtained.

Control of ink receptivity is essential in the production of high grade printing papers of uniform quality. Other factors being equal, the performance of a paper in any particular role of printing may be reasonably predicted by the oil penetration before the paper reaches the press. For example, "strike-through" which is a term applied to the staining of the reverse side of a printed sheet by the ink vehicle penetrating through the paper may be predicted if the absorption of the oil by the paper is very rapid. Strike-through affects the quality of printing on the reverse side of the sheet. On the other hand, a very slow rate of oil penetration indicates a tendency for offset to occur. Offset is the transfer of ink from a printed sheet onto the contacting side of the following sheet after printing and during the racking of the sheets or when folded, as in the case of forms printed on rotary presses.

SMOOTHNESS (FINISH)

Cognizant of the fact that a method for determining smoothness of paper is very important and highly desirable as a means for measuring one of the paper characteristics for printing quality the chairman has assigned this project to another member of the committee. There are several instruments for measuring the smoothness of paper, chief among these are the Gurley, Williams, and Bekk smoothness testers. These three instruments employ the same basic principle, measuring the rate of air flow between two surfaces. It is hoped that a method can be prepared to be applicable to all of these instruments which are now widely used in the paper industry.

### Graphic Arts Index

Some data have been collected with a view to preparing a Graphic Arts Index which would list the important technical articles published during the past 15 years. There are two main sources from which such information is being procured. The first and only one currently published is the one issued by the Educational Commission of the International Association of Printing House Craftsmen. The second is the Graphic Arts Index formerly published by the United Typothetae of America.

### Papers for Annual Meeting

The chairman has arranged for the presentation at the annual meeting of several technical papers having a bearing on the war effort of the graphic arts industry.

## New TAPPI Members

The executive committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership:

Walter J. Cassidy, Hawthorne Paper Company, Kalamazoo, Mich., has been reinstated as an active member.

Ralph T. K. Cornwell, director of research, Sylvania Industrial Corp., Fredericksburg, Va., a 1918 graduate of Cornell University, with a Ph.D. degree in 1925, and formerly with the U. S. Public Health Service, Washington, D. C.

Russell J. Eddy, president, Carl Schleicher & Schuell Company, 116 West 14th street, New York, N. Y.

Charles E. Foster, Jr., chemist, Oswego Falls Corporation, Fulton, N. Y., attended Syracuse University.

Robert B. Hamilton, Major, Q.M.C., purchasing and contracting officer, Jersey City Quartermaster Depot, 54 Exchange Place, Jersey City, N. J., a 1933 graduate of Ohio State University, and formerly with the International Paper Company.

Gunnar T. Hansson, president, Elof Hansson, Inc., 10 East 40th street, New York, N. Y., attended school in Sweden.

E. M. Lorenzini, engineer, American Bitumuls Company, 466 Forbes street, East Providence, R. I., a 1929 graduate of the University of Nevada.

Richard R. Lowell, chemist, Louis DeJonge Company, Fitchburg, Mass., a 1934 graduate of the University of Vermont and formerly with the Crocker, Burbank & Co. Assn.

Robert I. Moran, service engineer, National Aluminate Corporation, 6216 W. 66th Place, Chicago, Ill., a 1928 graduate of Iowa State College.

Clayton W. Priest, in charge chemical laboratory, Oswego Falls-Sealright Company, Fulton, N. Y., a 1934 graduate of Clarkson College of Technology.

John R. Shallcross, sales manager, Westinghouse Electric and Manufacturing Company, 3001 Walnut street, Philadelphia, Pa., a 1931 graduate of Cornell University, and formerly with the Bickley Manufacturing Company, Bala Cynwyd, Pa.

W. Godfrey Sturm, engineer, Edgar Steiner & Co., Inc., 9 Rockefeller Plaza, New York, N. Y., a 1925 graduate of Polytechnic Institue of Brooklyn, and formerly with the Polytechnic Institute and the Western Electric Company, New York, N. Y.

Lawrence S. Tobias, chemical engineer, International Paper Company, Glens Falls, N. Y., a 1938 graduate of Cornell University.

J. L. Munro, treasurer, Munro & Church Company, 10 High street, Boston, Mass., formerly with the Eastern Paper Company, Boston, Mass.

# Structural Viscosity Studies of Coating Clay Compositions

By George H. Sheets[1]


## Abstract

*An instrument for measuring and distinguishing thixotropy, dilatancy, plasticity, and Newtonian flow is described and suitable techniques for the use of this instrument have been developed.*

*Several representative coating clays were studied, and large differences in their flow properties were found to exist. It has been established that the differences in the flow properties of these clays are caused by differences in their particle size distribution, differences in clay species, and differences in their hydrating ability. Of these factors, particle size has the greatest effect upon the flow properties of the clays studied, when enough dispersing agent has been added to give minimum viscosity to the clay slip.*

*The amount of dispersing agent is the most important single variable and exerts the greatest effect upon the flow properties of the clay suspensions studied. It was definitely established that an intense thixotropic build-up occurs in suspensions made from these clays when certain amounts of dispersing agent are used; both sodium silicate and sodium pyrophosphate show this effect. The amount of dispersing agent required to give this thixotropic build-up is slightly less than the amount required to give minimum viscosity to the clay slip.*

*In two of the three commercial coating clays studied, acid washing of the clays altered their flow properties, tending to make them more nonhydrous. A mild heat treatment at a temperature of 250 deg. C. was found to irreversibly dehydrate a kaolinite clay sufficiently to change its flow properties to some extent. The flow properties indicate that the heat treatment produced an agglomeration of the particles of the clay. Neither acid washing nor heating, singly or in combination, was found to be sufficient to change the flow properties of one clay to those of another.*

*With one exception, there is little difference in the action of sodium silicate as compared with that of sodium pyrophosphate in regulating the flow properties of the coating clays studied. The one exception was in the case of an English clay, where it was found that excesses of sodium silicate over the amount required to give minimum viscosity resulted in a marked thickening effect. This did not happen when sodium pyrophosphate was used.*

*Clays with relatively large particle size show a weakly dilatant behavior over relatively wide clay concentrations, whereas clays with small particle size give a strongly dilatant behavior over a relatively narrow range of clay concentration, when enough dispersing agent has been added to these clay slips to give minimum viscosity.*

*For concentrated clay suspensions and with enough dispersing agent to give minimum viscosity, clays of smaller particle size give a thinner suspension for a given solids content than clays having a large particle size. This conclusion applies only where the clay fractions are of the same species.*

*It is shown that it is possible to have clay systems which possess simultaneously both dilatancy and thixotropy in the same slip.*


## Introduction

Clays long have been an important material in the manufacture of certain grades of paper. Their first use was as fillers for the purpose of imparting certain desirable printing qualities to the paper sheet, while later, with the advent of processes for coating paper, their use was extended and they became of still greater importance. During this time the paper manufacturer was little concerned about the fact that he possessed relatively little knowledge of clays and their behavior, because he experienced few difficulties in their use. However, the development of the rapid machine-coating processes, where the paper is made and coated in one continuous operation, brought with it a great many so-called "clay difficulties". For example, it was found that only clays from certain sources were acceptable for a given machine-coating operation, and that even different shipments from the same source sometimes varied as to their suitability.

In these new high-speed coating operations the coating color (the term used to designate the coating mix containing clay, starch, water, dispersing agent, etc.) undergoes intense shear as it passes under the coating rolls and, in order to produce a satisfactory coating, this color must possess certain desirable flow characteristics. Practical experience has pointed to the fact that the hydrous and flow properties of the clays themselves are of decided importance in regulating the flow characteristics of the finished coating color *(1, 2)*. Likewise, experience has shown that ordinary viscosity measurements of the clay slip before the addition of the adhesive are not sufficient to determine whether a certain clay is suitable for a given coating operation.

A survey of the literature reveals that little experimental data have been reported on the flow properties of clays with respect to paper manufacture and, therefore, it was felt that a fundamental study of these flow properties would be desirable. Through such a study, it should be possible to account for some of the factors which are of importance in regulating the flow properties of clays. Knowledge of this kind is important not only to the paper manufacturer but also to the clay producer.

## Measurement of Flow Properties

Any study of the flow properties of concentrated clay suspensions containing a dispersing agent involves the measurement of not only Newtonian but

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A portion of a thesis submitted in partial fulfillment of the requirements of The Institute of Paper Chemistry for the degree of Doctor of Philosophy from Lawrence College, Appleton, Wis., June, 1941. This work was carried out under the direction of Philip Nolan.

[1] Member TAPPI; Development Engineer, The Mead Corporation, Chillicothe, Ohio.

also of anomalous flow, including plastic flow, dilatancy, and thixotropy. The measurement of the latter two properties, especially thixotropy, presented a problem in itself, because no instrument or techniques suitable from the standpoint of this investigation had been developed. A promising beginning in the design of a proper instrument utilizing a principle similar to that used by Röder *(3)* had been made by Williams *(4)*, but this instrument had not been completely developed. Therefore, the first phase of this investigation constituted a study of this instrument, which led to modifications in design, and the development of suitable techniques for its use.

The completely developed instrument is shown in Figs. 1 and 2. The construction of the instrument is best seen in Fig. 2. The water bath (A) and the circular trough (B) of the instrument are constructed of sheet copper, and the lower base plate (C) is of brass. Both the shearing plate (D) and the upper base plate (E) are also of brass. The rotating head (F) is the top part of an ordinary Stormer viscometer. The large gear, which is normally within the casing (G), has been removed. To eliminate friction as far as possible, the weight of the rotating member is counterbalanced with weights (on a pan) through a thread of neglible torsion constant, as shown in Fig. 1. The circular trough (B) and the shearing plate (D) are coated with a chlorinated-rubber lacquer in order to make them impervious to attack by acid or alkali. H is a Cenco frictionless pulley.

The temperature of the material in the trough is maintained at a constant value by circulating water through the bath (A) from a constant temperature reservoir by means of a small centrifugal pump. The temperature of the water in the reservoir is regulated at 25 ± 0.2 deg. C. by a Cenco De Khotinsky thermo-regulator. The temperature control apparatus is shown in the lower part of Fig. 1.

The chief difference between this type of viscometer and other rotational viscometers, such as the Stormer or McMichael, is that, with this instrument, a measurement of thixotropy can be achieved. This is possible because the shearing body of this instrument is always contacting new material which has not been previously disturbed during any given measurement. This will be explained in more detail under the Measurement of Thixotropy.

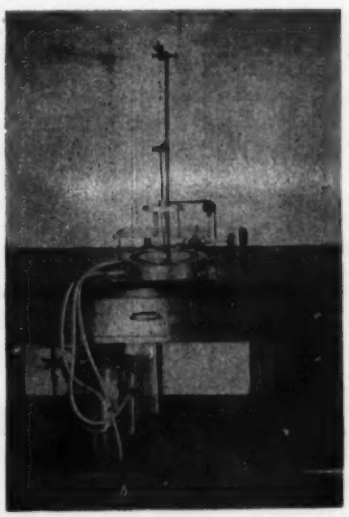

FIG. 1
The Apparatus.

The results obtained in this investigation have been reported in the form of speed-weight curves. This is necessary because in most of the systems studied in this investigation a single measurement of the apparent viscosity of the system is without meaning and it is necessary, therefore, to construct a speed-weight curve in order to characterize the type of flow possessed by the system. Only a few of the curves obtained are reproduced in this paper.

## Operation of Instrument

### Measurement of Newtonian Fluids

The measurement of the flow properties of Newtonian fluids is relatively simple. As is well known, the viscosity of such a fluid is independent of the rate of shear and, therefore, a measurement of Newtonian liquids in this apparatus should yield speed-weight curves which are straight lines. Experimentally determined speed-weight curves for four Newtonian liquids of varying viscosities (lubricating oil, glycerin, castor oil, and Karo sirup) were obtained by hanging various weights on the driving cord of the viscometer and determining the angular speed of the streamlined drag body through the fluid by measuring the time required for the body to travel a given distance. For the more viscous liquids and under relatively high rates of shear, a slight nonlinearity of the speed-weight curves develops, because under these conditions, the drag body imparts rotation to the material in the trough, a condition which can be prevented by the installation of suitable baffles in the trough. It is to be noted that all of these curves extrapolate to a weight of 0.6 gram, a value which represents the weight that is necessary to overcome the friction in the bearings of the instrument. Unlike systems possessing anomalous flow properties, a Newtonian system is fully characterized by a single point on the speed-weight curve. This instrument was found to be suitable only for the measurement of Newtonian liquids with viscosities greater than 100 centipoises.

### Measurement of Dilatancy

The general method for the measurement of dilatant systems is the same as that for Newtonian fluids —i. e., angular speeds corresponding to various driving weights are determined and a speed-weight curve is constructed. The results of such measurements on a dilatant system—a 44% suspension of uncooked potato starch in water—was studied. It was noted that a condition is reached where a large increase in weight results merely in a slight increase in the angular speed of the drag body. In this region, the drag body travels with a jerky, pulsating motion.

Dilatant systems are characterized by this concavity of the speed-weight curve to the weight axis. Röder *(3)* postulated that the degree of dilatancy is given by the angle between the two straight-line portions of the speed-weight curve; the smaller the angle, the greater the degree of dilatancy.

### Measurement of Thixotropy

The measurement of thixotropy is considerably more complicated than is that of dilatancy, plastic systems, or Newtonian liquids. Because the flow properties of a thixotropic system are a function of

its "past history", this variable also must be taken into account in its measurement. The general procedure usually followed in the measurement of a thixotropic system is, first, to completely break down its structure. The build-up of structure with time is then measured by a suitable method.

In this investigation the following technique of measurement was used for thixotropic materials. The thixotropic system was placed in the trough of the instrument. The top part of the viscometer was then placed in position and suitable weights were placed on the driving cord, after which the drag body was rotated for several revolutions, reversing the direction of rotation after each revolution. This was easily accomplished by rotating the member 1 (*see* Fig. 2) in an oscillating manner. Such a stirring procedure was found to be sufficient to break down any thixotropic structure present. After five or six rapid oscillations, the drag body was immediately released from a position nearest the operator. This allowed one-half revolution for the body to attain terminal speed. The angular speed of the drag body was then obtained over the remaining half of the revolution by means of a stop watch. The stirring procedure was again repeated but, instead of releasing the drag body immediately after stirring, the system was allowed to stand undisturbed for a determined length of time, such as 30 seconds, 1 minute, 2 minutes, etc., after which the drag body was released and the angular speed over the latter half of the revolution was again determined.

After the angular speeds corresponding to different setting times were determined for a given weight, a different weight was placed on the driving cord and the procedure repeated. A sufficient number of weights were used so that complete speed-weight curves could be constructed. In a typical speed-weight curve of a thixotropic system—an 8% suspension of bentonite—it was observed that the thixotropic build-up of this system resulted in an increase of the Bingham yield point with time, the intercept of the extension of the straight-line portion of the flow curve and the weight axis being called the Bingham yield point.

If the above technique for the measurement of thixotropic systems is used on truly plastic systems, no shift of the speed-weight curve with setting time is obtained.

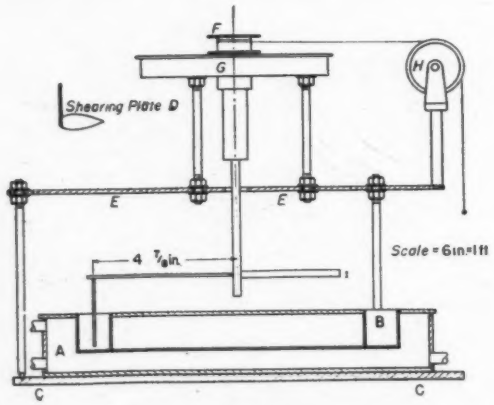


FIG. 2
**Diagrammatic Sketch of the Apparatus.**



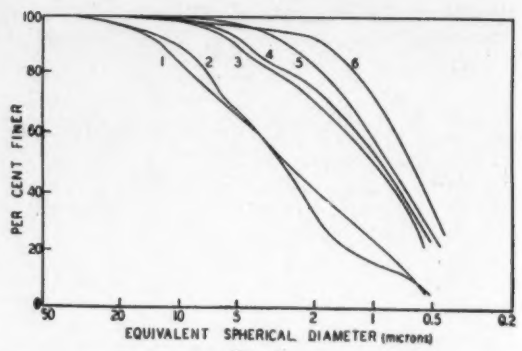


FIG. 3
**Particle Size Data for Clays (Clays: 1—A; 2—F; 3—B; 4—C; 5—E; 6—D).**

## Materials and Experimental Methods

### CLAYS USED

A total of six clays (A-F) were studied in this investigation. Clays B, D, E, and F were from the same clay crude—a Georgia secondary clay. All four of these clays had received the same basic chemical treatment. Clay F was the coarse fraction and Clay D was the fine fraction of this cl. y crude, Clay E being an intermediate fraction between the Clays B and D.

Clay C was also a Georgia secondary clay, whereas Clay A was a primary clay.

In order to characterize these clays more completely, X-ray data and particle size measurements were obtained. The X-ray data and their interpretation were supplied by G. L. Clark of the University of Illinois. All the diffraction patterns, except that of Clay A, correspond exactly with kaolinite. Additional weak lines in the diffraction pattern of Clay A correspond to illite, which was identified quite positively. The data also indicate essentially the same size for primary particles. Thus, the apparent particle size differences of these samples must refer to secondary aggregates.

### DETERMINATION OF PARTICLE SIZE

Particle size determinations on these clays were carried out by the Casagrande hydrometer method *(5, 6)*. The results of these measurements are shown in Fig. 3. The following procedure was used in the preparation of the samples for the analysis: 20.0 grams of clay were placed in about 500 cc. of distilled water to which had been added 0.2 grams of Daxad 11. This suspension was stirred with a rod and allowed to stand for about 30 minutes, after which it was passed once through a small hand homogenizer. The suspension was then allowed to stand overnight, transferred to a liter graduate, and diluted to 1000 cc. The graduate was inverted several times to thoroughly mix the suspension, the time was noted, and specific gravity readings were taken at varying intervals. To eliminate temperature corrections of the specific gravity of the suspension, a blank solution containing 0.20 gram of Daxad 11 per liter was used, since merely a difference in specific gravity is required. The percentage of material finer than a given size was calculated from the specific gravity readings, and the equivalent spherical diameter was determined by means of a Casagrande nomographic chart *(5)*. Specific gravities of the clays were measured by a typical pycnometer method employing kerosene in place of water.

### Preparation of Hydrogen Clay

The following procedure was found adequate for the preparation of large batches of hydrogen clay. Four pounds of the clay were made into a thin slurry, which was passed through a Büchner funnel (no filter paper was used) to remove any lumps. After filtering, the suspension was placed in a 5-gallon jar and sufficient technical hydrochloric acid and water were added to make 16 liters of 2 *N* acid. The suspension was stirred well and allowed to stand for about 24 hours. At the end of this time the clay had settled sufficiently so that about 10 liters of the acid solution could be decanted off. Fresh 2 *N* acid was added, the suspension again stirred, and allowed to settle. After three such acid treatments, the clay was washed free of acid by decantation. The end point of the washing was taken as the point where no chlorides could be detected in the supernatant wash water. After the washing was completed, the clay suspension was filtered on Büchner funnels and the filter cakes were air dried. Specially softened water with a purity comparable to that of distilled water (Zeo-Karb process) was used throughout the washing process.

### Preparation of Dispersing Agents

In this investigation two dispersing agents commonly used commercially were employed—sodium silicate and tetrasodium pyrophosphate. For convenience and accuracy in measurement, a stock solution of sodium silicate was prepared by diluting 200 cc. of the 40% solution with distilled water to a volume of 2 liters. This solution was then analyzed for total solids, sodium oxide, and silica. The ratio of sodium oxide to silica was 1:3.64. A stock solution of tetrasodium pyrophosphate also was prepared by dissolving 40 grams of the decahydrate in distilled water and diluting to 1 liter.

### Preparation of Clay Slips

In all of this work the same procedure was followed in the preparation of the clay slips. To the proper amount of dispersing agent the correct volume of distilled water was added to give the desired solids content. To this mixture, which was stirred continuously by means of a "Mixmaster," 600 or 800 grams of clay were added slowly. The slip was then allowed to mix for a standardized length of time which was 45 minutes in all cases except those of

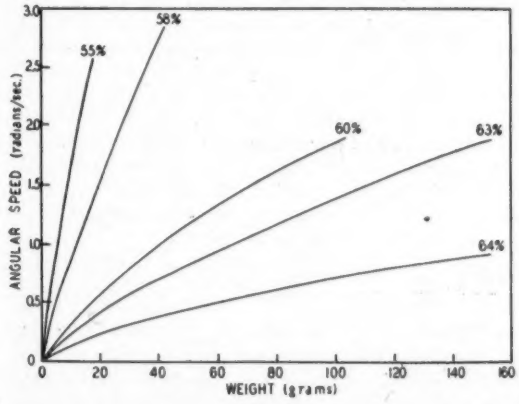


Fig. 4

**Effect of Clay Concentration on Flow Properties of Clay A (0.5% Sodium Pyrophosphate Decahydrate Used as Dispersing Agent).**

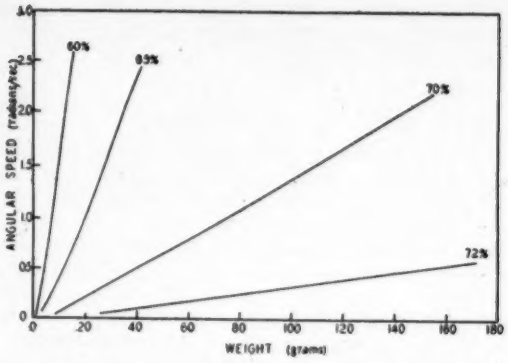


Fig. 5

**Effect of Clay Concentration on Flow Properties of Clay C (0.5% Sodium Pyrophosphate Decahydrate Used as Dispersing Agent).**

Figs. 4-6. The latter slips were mixed for 15 minutes. After mixing, the temperature was adjusted to 25 deg. C. and 600 cc. were placed in the trough of the viscometer—this being enough to fill the trough to within ⅛ inch of its brim.

### Measurements of Flow Properties of Clay Slips

After the trough of the viscometer had been filled with the system to be measured, the removable top part of the viscometer was set in place, and the counterweight for reducing friction was attached. Enough weight was then attached to the driving cord to move the drag body through the suspension at a moderate speed. The first step was to determine if the system possessed thixotropic properties, which was done by the procedure outlined under the Measurement of Thixotropy.

If no thixotropic build-up was found, the measurement was greatly simplified, the procedure for the measurement of Newtonian liquids being used. If the system has any tendency to settle out, it must be stirred with a spatula between speed-weight observations.

Complete data for the construction of a speed-weight diagram were determined by using suitable driving weights and determining the angular speed of the drag body. In all the data reported in this investigation, the load scale in the speed-weight curve was the total weight added to the driving cord of the instrument. No correction was made for the friction of the instrument, which amounted to 0.6 gram.

## Flow Properties of Commercial Coating Clays

### Effect of Clay Concentration

In the preparation of clay slips for use in the compounding of the finished coating color, enough dispersing agent is used to give minimum viscosity to the clay slip. Therefore, in order to obtain a reliable impression of the flow properties of these clays, they were studied with an amount of dispersing agent comparable to that used commercially.

Clays A-C were made into slips of various solids contents and the flow properties were measured in the viscometer. One half per cent of sodium pyrophosphate (on the dry weight of the clay) was used as the dispersing agent, an amount found to be sufficient to give minimum viscosity to the slips from Clays B and C, whereas a slightly greater amount was required by Clay A. The result of the viscometric measurements are shown in Figs. 4-6.

The outstanding conclusion concerning these re-

sults is that very wide differences in the flow properties of these three clays exist. The systems made from Clay A (Fig. 4) are to be classed as weakly dilatant systems; this dilatancy is observed to exist over a comparatively wide range of solids contents. This is to be compared with that of Clay C (Fig. 6) which possesses a high degree of dilatancy over a comparatively narrow range of solids concentrations. Clay B, on the other hand, did not exhibit dilatancy (Fig. 5).

Another observation of pertinence is the difference in solids content corresponding to a given apparent viscosity for the various clays. In this particular case, it may be said that a clay slip prepared from Clay C and containing 70% solids is equivalent in viscosity to a 60% Clay B slip or to one containing 55% of Clay A. This is of decided commercial importance to the papermaker, because a coating color with given viscosity relationships at high solids content is more advantageous from an operating standpoint than one with the same viscosity relationships but at a much lower solids content. However, this advantage is valid only if the flow properties of these two hypothetical coating colors are the same, and the properties of the finished coating are also the same, which may or may not be the case.

One other important conclusion from these data is that a single viscosity determination of a clay slip is not sufficient to give a true indication of its flow behavior, although this is a common mill practice. Thus, from the data in Fig. 4, it is apparent that the viscosity reading which would be obtained at one rate of shear would be different from that determined at another. To really characterize a clay slip, it is necessary, therefore, to give the complete speed-weight curve.

The wide differences in the flow properties of the three commercial coating clays (A-C) might be due to several causes. First, the sizes of secondary particles of these three clays are different as shown in Fig. 3 and this might account for these differences. X-ray data show that the sizes of the primary particles are the same. Therefore, the differences in particle size as shown by the Casagrande hydrometer method must be attributed to differences in the sizes of secondary particles or aggregates. However, in the particle size determinations the standard dispersing agent (Daxad 11) was used. Admittedly, its

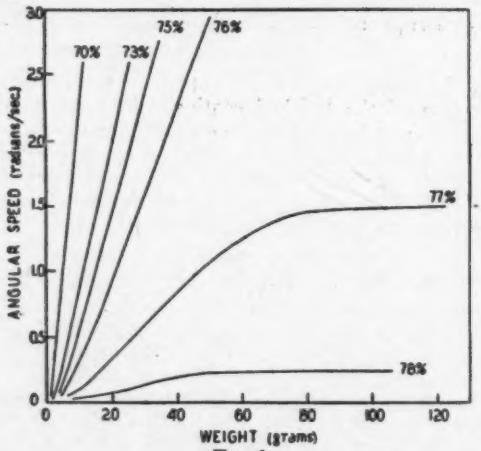


FIG. 6

Effect of Clay Concentration on Flow Properties of Clay B (0.5% Sodium Pyrophosphate Decahydrate Used as Dispersing Agent).

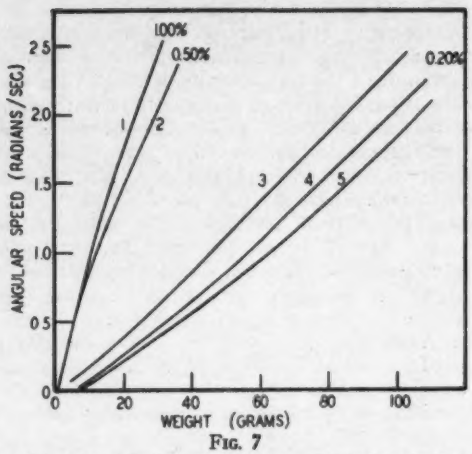


FIG. 7

Effect of Amount of Sodium Pyrophosphate Decahydrate on the Flow Properties of 58% Clay A Slips (Setting Time—Sec.: 1, 2, and 3—0; 4—30; 5—60).

effects of disaggregation might not be the same as that of the dispersing agents—sodium silicate and tetrasodium pyrophosphate—used in the viscosity studies. Since, in general, with materials other than clay the dispersing action of these three agents is not very different, the differences in aggregate sizes found when using Daxad 11 most probably are real. A second possibility is that the hydrous characteristics of these three clays might be different. The X-ray data show that both Clay C and Clay B are kaolinite. This clay species has a relatively low base-exchange capacity and low hydrating ability. Because of these facts, however, these clays should have about the same hydrating characteristics. If there were any variation, Clay C would be expected to be slightly more hydrous than Clay B, because of its finer particle size, but this is not corroborated by the data on the flow properties, which would lead one to believe that Clay B was the more hydrous.

The flow data obtained from Clay A lead to the conclusion that this clay is the most hydrous of the three clays, provided that the effect of particle size is neglected. X-ray data have shown that this clay contains an unknown amount of illite, a clay species which has a considerably greater base-exchange capacity and is also more hydrous in character than kaolinite. The particle size of Clay A is considerably larger than either that of Clay B or C, which also undoubtedly explains some of the differences which exist in the flow properties of some of the clays.

In summing up the above discussion, it can be stated that the wide differences which exist in the flow properties of the three coating clays studied are to be attributed partly to a difference in hydrating ability of these clays and partly to differences in particle size. The effect of particle size will be discussed in detail later.

### Effect of the Amount of Sodium Pyrophosphate as the Dispersing Agent

Figure 7 shows the effects of various amounts of sodium pyrophosphate (based on the dry weight of the clay) upon the flow properties of 58% suspensions of Clay A; similar curves were prepared for the effects of this chemical upon 60% suspensions of Clay B and upon 70% suspensions of Clay C, the two being quite similar. From the curves it is seen that

the dispersing agent decreases both the yield point and the mobility of the clay slips.

One important observation to be gathered from these data is that an intense thixotropic build-up occurs when an amount of dispersing agent somewhat less than that required to give minimum viscosity is used. In Fig. 7, it may be observed that with 0.20% dispersing agent a very pronounced structural build-up occurs. However, with 0.50% an extremely slight build-up was present (not shown on graph), whereas with 1.00% dispersing agent no thixotropic build-up was detectable. This behavior is also representative of the other two clays. With the exception of Clay A, an amount of dispersing agent greater than 0.50% causes a slight increase in the apparent viscosity of the clay slip. This might be due to the beginning of coagulation caused by an excess of the dispersing agent.

The thixotropic build-up which occurs over a critical range of concentrations of dispersing agent is believed to be explained as follows: As is well known, a concentrated clay-water suspension is quite plastic. This structure can be explained by postulating a structure of particles more or less rigidly held together by an interplay of attraction and repulsion forces *(7)*. This structure is easily broken down by shear but reforms immediately at the cessation of any mechanical disturbance. In other words, an extremely short time is required for this structural build-up to take place. After a sufficient amount of the dispersing agent has been added, however, this structural build-up occurs at a measurable rate. If it is assumed that the negatively charged pyrophosphate ions are adsorbed on the clay particle, as Ford, Loomis, and Fidiam report *(8)*, a net increase in the negative charge on the clay particles will result. Since, under these circumstances, the net repulsion between the particles is increased, time must be allowed (because the relatively stronger repulsion force must be overcome) for the particles to reach positions relative to one another where the interplay of all forces will result in an equilibrium between the attraction and repulsion forces.

If a coating color with thixotropic properties is desired, it should be possible, therefore, to attain this by proper relation of dispersing agent to clay. However, this is mere speculation, because the presence of starch in the coating color might obscure this effect. A detailed investigation with coating mixes would reveal whether or not this occurs.

### Effect of the Amount of Sodium Silicate as the Dispersing Agent

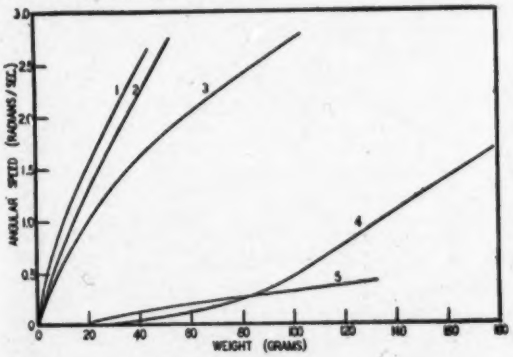


FIG. 8

Effect of Amount of Sodium Silicate on the Flow Properties of 58% Slips of Clay A (2—0.20%; 3—0.50%; 1—2 and 3, 24 hr. later; 4—0.15%; 5—0.70%).

Figure 8 shows the effect of various percentages of sodium silicate (based on the dry weight of the clay) upon the flow properties of 58% suspensions of Clay A. The effect of various amounts of sodium silicate upon the flow properties of a 60% suspension of Clay B, and upon a 70% suspension of Clay C was also studied.

From Fig. 8, it is to be observed that the amount of sodium silicate needed to give minimum viscosity to the clay slip is very critical. Amounts greater than this increase the apparent viscosities and also enhance the dilatant tendencies of this system. Why such small increases in the amount of dispersing agent should cause such wide changes in the flow properties is a point of conjecture, but may be the result of a coagulating effect of the dispersing agent. When these slips were allowed to age for 24 hours or longer and were again measured, the flow properties were found to be much different. After 24 hours, the slips containing 0.20% and 0.50% dispersing agent gave identical speed-weight curves as shown in Fig. 8, and the slip containing 0.70% sodium silicate gave a curve which was almost identical to that of the 0.50% curve in Fig. 8. This same slip, 70 hours later, gave a curve which was about the same as that of the 0.20% curve in Fig. 8. The slow thinning out of these slips may be the result of a slow redistribution of the dispersing agent as the slip is aged. The peculiar phenomenon described above was not observed for the other two clays; the speed-weight curves obtained after 24 hours were practically identical with those measured immediately after preparation. Also, this phenomenon was not observed in the case of Clay A when sodium pyrophosphate was used as the dispersing agent. The flow characteristics of these slips did not change on aging.

As with sodium pyrophosphate, a pronounced thixotropic build-up occurs with critical amounts of sodium silicate. There is little difference between the effects of 0.50% and 1.00% sodium silicate upon the flow properties of 60% slips made from the Clay B. Small differences exist between the effects of 0.20 and 0.50% sodium silicate for Clay C.

The curves for the effects of solids content upon the flow properties of Clay C when 0.20% sodium silicate is used as the dispersing agent are quite similar to those of Fig. 6. The marked dilatant properties assert themselves at a slightly lower solids content when sodium silicate is used as the dispersing agent.

In review of the effect of sodium silicate upon the flow properties of these commercial coating clays, it is concluded that small differences exist between its effect and that of sodium pyrophosphate. In the case of Clay A an excess of sodium silicate over that required to give minimum viscosity produced a marked thickening of the clay slip, which was not observed when sodium pyrophosphate was used as the dispersing agent.

### Flow Properties of the Acid-Washed Clays

Clays as mined contain various amounts of exchangeable bases such as calcium, magnesium, sodium, iron, etc., which have an important effect upon the hydrating characteristics of the clay. The amount of these exchangeable ions is regulated by the species and the surface activity of the clay. Thus, by exchanging and regulating the amount and kind of exchangeable bases present in a clay, it should be pos-

sible to change its flow behavior to a certain extent. With this in mind, the three commercial coating clays were acid-washed to convert them to hydrogen clays—i.e., a clay which has had its exchangeable ions replaced by hydrogen ions.

In the preparation of the slips for the viscometric measurements, the solids concentration of the slip was chosen so that a comparison between the acid-treated clay and the untreated clay could be made. Sodium pyrophosphate was used as the dispersing agent. Some of the results of the viscometric measurements are shown in Fig. 9. A comparison of the results of Fig. 9 with those of Fig. 4 shows that acid washing of Clay A has changed the amount of clay required in the clay slip for a given speed-weight curve. A slip containing 62% acid-treated clay had the same curve as a slip with 58% of the untreated clay, both of these slips containing the same amount of dispersing agent.

A slip of 65% acid-washed Clay B (0.30% dispersing agent) has nearly the same viscosity relationship as that of a slip containing 60% of the untreated clay which contains 0.50% dispersing agent (Fig. 5). It is also to be noted that less dispersing agent is required by the acid-washed Clay B to give minimum viscosity than by the untreated clay. This is possibly explained by the fact that some of the pyrophosphate ion is bound by calcium, magnesium, iron, etc., which are present as exchangeable bases in the untreated clay. Thus, this bound pyrophosphate ion is no longer available for adsorption on the clay and more of the dispersing agent must be added in order to obtain complete dispersion.

A comparison of the flow properties of suspensions of 70% acid-washed Clay C with the unwashed clay shows that, unlike the other two clays, no significant differences are to be observed as to the amount of solids necessary for a given viscosity, provided that sufficient dispersing agent has been added to give minimum viscosity.

Potentiometric titrations of 20% suspensions of the hydrogen clays show their base-exchange capacity to be as follows:

| | Milliequivalents of NaOH/100 g. of clay |
|---|---|
| Clay A | 2.90 |
| Clay B | 2.18 |
| Clay C | 1.62 |

The presence of illite in Clay A accounts for its relatively high base-exchange capacity. The intense structural build-up of this clay suspension containing 0.26% sodium pyrophosphate (Fig. 9) is noteworthy because of the fact that the mobility of the system changes with setting time.

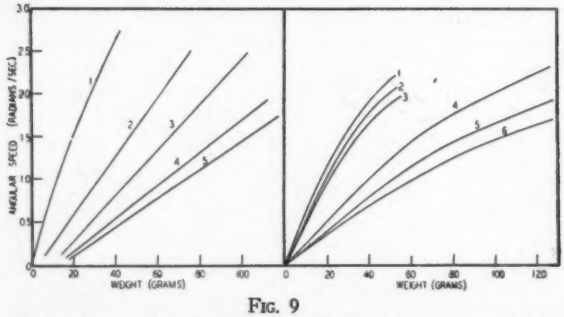


FIG. 9

Effect of Amount of Sodium Pyrophosphate Decahydrate on the Flow Properties of 62% Slips of Acid-Washed Clay A. Left: 1—0.50%; 2—1.00%; 3, 4, and 5—0.26%. Setting Time (Sec.): 1, 2, and 3—0; 4—30; 5—60. Right: All 0.30%. 4, 5, and 6—24 hr. Later. Setting Time (Sec.): 1 and 4—0; 2 and 5—30; 3 and 6—60.

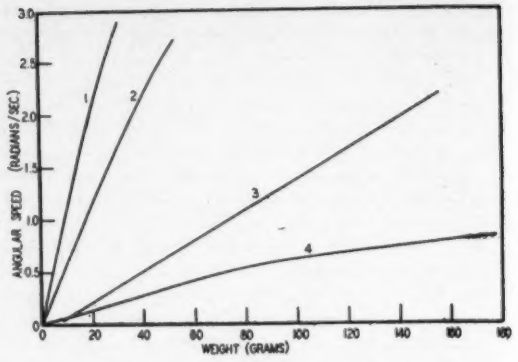


FIG. 10

Effect of Heat Treatment on the Flow Properties of Clay B (0.50% Sodium Pyrophosphate Decahydrate Used as Dispersing Agent). 1. 70% Acid-Washed and Heat-Treated; 2. 70% Heat-Treated; 3. 70% Untreated; 4. 74% Heat-Treated.

The curves in Fig. 9 represent a very peculiar type of system—one which is dilatant and, at the same time, builds up a structure on standing which is more resistant to shear. Such a condition might be explained by assuming the formation of agglomerates (tactoids) which are independent of one another after they have formed. Any agitation breaks up these agglomerates readily and, as soon as this agitation ceases, they reform.

In reviewing the effects of acid-washing upon the flow properties of these clays, it may be concluded that acid-washing has some effect upon the flow properties of Clays A and B and little effect upon Clay C. In any case, it was not possible to change the properties of the clays sufficiently to alter the characteristics of one clay to those of another. Since the base-exchange capacity of these clays is low, their flow properties would be expected to depend but slightly on the character of the exchangeable bases. It would appear from these data, therefore, that other properties of the clay, such as particle size and shape, are of considerably more importance in regulating these flow properties.

### Effect of a Mild Heat Treatment upon the Flow Properties of Clays

Figures 5 and 6 show Clays B and C to be quite different in flow behavior. Since the particle size distribution of these clays are closely similar, it seemed logical to postulate that part of this difference should be due to a greater hydrating capacity of Clay B. Thus, an effort was made to change the hydrous properties of this clay by a mild heat treatment (1½ hours at 250 deg. C.). The results are shown in Fig. 10. All three of these clay slips contained 0.50% sodium pyrophosphate as the dispersing agent.

Comparison of the curves in Figs. 10 and 5 shows that heat treating Clay B had some effect in changing its flow properties. As was expected, it made the clay more nonhydrous and gave a weakly dilatant property to the clay slip.

Because the acid-washed clay would be expected to be more nonhydrous than the unwashed clay, it was also heat treated. The result is shown in Fig. 10. From a comparison of this curve with that of the acid-washed clay which was not heat treated, it is again observed that heat treating has made the clay more nonhydrous. The rather marked dilatant property of a 74% suspension of the heat-treated Clay B is also shown in Fig. 10.

The effect of such mild heat treatment is believed to result in an irreversible dehydration and aggregation of the clay particles. This is possible, because this clay species is composed of one gibsite sheet and one sheet of tetrahedral silica groups. Two particles, therefore, may become aggregated if the silica plane of one clay particle approaches a gibsite sheet of another particle after both particles have been dehydrated by the heat treatment. Primary valency forces can then come into play, and when the clay is again placed in suspension, redispersion of these aggregates does not take place. This should especially be the case for the acid-washed clay, because the planes can approach one another more intimately owing to the small size of the hydrogen ion, which has replaced the atomically larger exchangeable bases of sodium, potassium, etc.

Evidence for the aggregation of the clay particles because of heat is offered in the results obtained in this work. The curves of Fig. 10 show a weakly dilatant effect in these clay slips. This is believed to point to the presence of rather large clay aggregates, because this same property was observed for Clays A and F, two clays of rather large particle sizes. Another bit of evidence is the base-exchange capacity of heat-treated, acid-washed Clay B, which was identical with that of acid-washed Clay C. This decrease in base-exchange capacity of the heat-treated clay can be partly accounted for by a decrease in the specific surface of the clay, for the property of base-exchange is a surface effect.

Because acid-washed Clay C and acid-washed, heat-treated Clay B had the same base-exchange capacity and were of the same clay species, their hydrating characteristics should be closely similar, and any differences observed in the flow properties of these two clays could be attributed, to a large degree, to a difference in particle size. In comparing acid-washed Clay C and acid-washed, heat-treated Clay B, it was seen that some differences in the flow properties of these two clays still exist—differences which are, therefore, very probably due to a difference in particle size or particle shape.

In the course of this heat-treating work a very interesting system was encountered. On heating one sample of clay (this was not one of the clays used in this investigation) for 1½ hours at 250 deg. C. and then making it into a slip, a system was obtained which had both intense dilatant and thixotropic properties. The suspension contained 68.5% solids and 0.50% sodium pyrophosphate. When this system was placed in a small beaker and allowed to stand, it developed such a resistant structure that on inversion of the beaker no flow took place. If this system were stirred slowly, it became fluid, and if stirred rapidly, it exhibited intense dilatancy. Unfortunately, an amount of this clay sufficient for a measurement in the viscometer was not available. It is believed, however, that the general shapes of the curves would have been something like those in Fig. 9. The existence of both of these properties might be explained by the fact that the correct amount of dispersing agent was present to give the thixotropic build-up, and also that the correct solids content necessary for the dilatant properties was present.

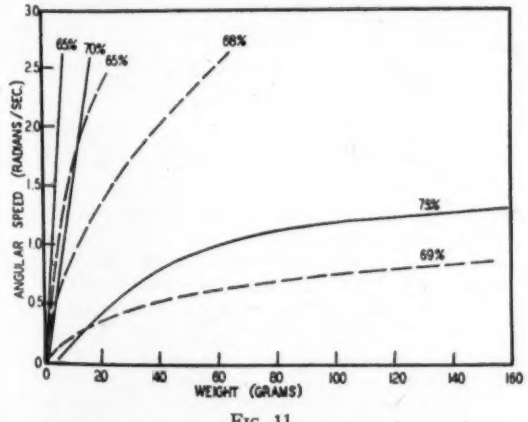


FIG. 11

Effect of Clay Concentration on Flow Properties of Clays D and F (Clay D = ———; Clay F = – – – – –).

The flow properties of heat-treated Clay B more nearly resembled those of Clay C but in no case was it possible to convert the flow properties of the former into those of Clay C. The nearest approach to accomplishing this was in heat treating the acid-washed clay.

Therefore, it is to be concluded that heating kaolinite clays to moderate temperatures results in a change in the flow properties of these clays which is believed to be caused by an irreversible dehydration and an agglomeration of the clay particles.

### Flow Properties of Fractions of the Same Clay Crude

The previous work has shown that it has been impossible to sufficiently change the properties of Clays A-C by acid-washing or heating to make the flow properties of one clay like those of another. Likewise, the results indicated that particle size was quite important. To prove this, three fractions of the same clay crude (Clays D-F) were obtained, differing from Clay B, which was also obtained from this same clay crude, only in particle size. Thus, four fractions of the same clay crude were available for study. X-ray data showed these clays to be the same species—namely, kaolinite. The particle size data for these clays are given in Fig. 3.

The flow properties of suspensions of these clays at various concentrations and with the same amount of dispersing agent (0.50% sodium pyrophosphate on the weight of the clay) are shown in Fig. 11. From Fig. 11, it is seen that a striking similarity exists between the type of flow properties of Clay F and that of Clay A shown in Fig. 4. For a given solids concentration, the Clay A is seen to give a system of greater consistency. This can be attributed to the fact that this clay contains some illite, a more hydrous type of clay. Since these two clays have approximately the same particle size distribution, it is reasonable to conclude that the distinctive flow curves obtained for these two clays are related to their comparatively large particle sizes.

The flow properties of Clay E closely resemble those of Clay C, even though Clay E is somewhat finer in particle size than Clay C. Clay D (Fig. 11) has nearly the same flow properties as Clay E, although this clay is considerably finer in particle size than Clay E or C. This would tend to show that below a certain value, differences in particle size do not have a great effect upon the flow properties.

It is observed from Fig. 5 that the flow properties of Clay B fall between those for the Clay F and Clay E, as is to be expected from their particle sizes.

The intense thixotropic build-up, observed for Clays A-C with certain amounts of dispersing agent, also was encountered in the case of Clays D and E.

From these data it can be concluded that particle size is quite important in determining the flow properties of concentrated clay suspensions when enough dispersing agent has been added to give minimum viscosity. This, of course, assumes that the clay is composed of a single clay species. This work shows that, for commercial coating clays of coarser particle size, weakly dilatant properties exist in concentrated suspensions. Likewise, in these concentrated suspensions, as high a solids content cannot be realized as in the case of clays having smaller particle size. Below a certain size, the flow properties are not affected to any extent by a change in particle size.


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## Canadian Technical Section Meeting

The Technical Section of the Canadian Pulp and Paper Association will hold its 1943 Annual Meeting at the Mount Royal Hotel, Montreal, Quebec, January 27-29. The theme of the meeting will be "Conservation and Waste Elimination."

The program for Wednesday, January 27, consists of formal papers as follows:

1. Groundwood Stock Blending by E. Overstrom, Gulf Pulp and Paper
2. The Grinding of Birch by W. W. Holland, Quebec North Shore Paper
3. Some Interrelationships of Pulp Properties by J. d'A. Clark, Institute of Paper Chemistry
4. Most Pleasing White Papers from Unbleached Sulphite Pulps by A. K. Ames, Canadian Industries Limited
5. Reddening of Unbleached Sulphite Pulps by A. K. Ames, Canadian Industries Limited
6. Some Observations on Pulpwood Types and Their Preparation in Relation to Pulp Cleanliness by M. Barsalou and L. J. Rioux, Fraser Companies, Ltd.
7. Accidents—Our Greatest Waste by A. E. H. Fair, Howard Smith Paper Mills Limited, Cornwall
8. Plastics and the Paper Industry by R. V. V. Micholls, McGill University
9. Corrosion Test Data—Guide to the Selection of Substitute Materials by R. T. Barnes, Jr., T. E. Lagerstrom, J. W. Wing, International Nickel Co. of Canada, Ltd.
10. A Study of Stock Preparation in Paper Board Mills by W. H. deMontmorency, Gair Company Canada Limited.
11. Instrumentation in Kraft Pulp Mills by A. J. Philip, Canada Paper Company
12. Sulphite Blow Heat and Gas Recovery by J. N. Swartz, Howard Smith Paper Mills Ltd., Cornwall

The morning of the second day of the meeting will be devoted to group discussion meetings. The afternoon of the second day will be devoted to an open meeting to discuss the conservation and substitution of critical materials. This meeting will be a full-scale, off-the-record group discussion and nine members of the Technical Section have agreed to answer questions submitted by members at this meeting.

The last day of the Annual Meeting will be entirely devoted to group discussions, held under the auspices of the Section's various committees.

Those who expect to attend are urged to make their reservations at once.



## Crane Workers Win Army-Navy "E"

Nearly 15,000 more Chicagoans soon will become wearers of the Army-Navy "E" by the award of that high honor to Crane Company and its employees. Unlike most "E" winners gaining it for outstanding production of arms and munitions, the Crane plant is being cited for high achievements in meeting vast wartime demands for its regular products, namely, valves, fittings, and piping accessories.

The citation brings to light the company's foresightedness even prior to Munich, in gearing itself for greatly expanded production activity. Sensing then a definite possibility of increased need for its products, a program resulting in better and faster manufacturing of valves was immediately started. Throughout the expansive plant located on Chicago's southwest side, production effort was steadily intensified as new equipment was added and manpower multiplied. When threat of war became a reality, no conversion was necessary, merely greater concentration on the part the plant would play in arming the Nation and its allies.

All employees will be invited to the "E" presentation ceremony scheduled later this month. Representative workers will be elected to receive the award. Acceptance of the "E" burgee to be flown over the plant will be made by J. H. Collier, president of Crane Company, for many years vice president in charge of manufacturing to keep non-productive time at a minimum, and for the convenience of the greatest number of employees, the short but impressive award ceremony will take place between shifts.

## Lake States TAPPI Discusses Inks

The Lake Section of the Technical Association of the Pulp and Paper Industry met at the Conway Hotel, Appleton, Wis., on Tuesday evening, January 12. This was a joint meeting with the Northeast Wisconsin Section of the American Chemical Society. John H. Graff of the Institute of Paper Chemistry, presided as chairman. About seventy attended.

R. G. Macdonald, national secretary-treasurer of TAPPI, gave a brief outline of conditions in the industry and prospects for the immediate future.

The principal speaker was Fred A. Weymouth of the International Printing Ink Company, who talked on "The Changes of Printing Ink Due to the War Effort." In this talk Mr. Weymouth took up in detail the constituents of each major colored ink and indicated the status of their availability and possibility of substitutes. An interesting discussion followed which dealt largely with a consideration of ink testing methods and the measement of printability.

## Weston Co. is 50 Years Old

This year of 1943 is a notable milestone in the history of one of the world's oldest manufacturers of corrugating materials. Founded in 1893 by Edward Banning Weston, the Weston Paper and Manufacturing Company of Dayton, Ohio, has served users of straw paper continuously for fifty years. The company's first mill was built in 1893 in Greenfield, Ind., where straw wrapping paper was made. It was discontinued in 1901 when a new straw mill, then the largest, was built in Terre Haute, Ind.

Coincident with the advent of corrugated paper for carpet lining, photo mailers, bottle wrappers, etc., and, later, for single faced and double faced board and boxes, this first Terre Haute mill gradually switched from straw wrapping to straw paper for corrugating purposes. With foresight Mr. Weston chose the market capable of greatest expansion.

With this new market in mind, Mr. Weston in partnership with Oliver Jacobs of the Philadelphia Paper Board Company, organized the Auglaize Box Board Company of St. Marys, Ohio, in 1901, and purchased a mill there for the manufacture of jute liner board, tube and can stock and similar products. In 1907 Mr. Jacobs sold his interest in this venture to Mr. Weston and it became part of the Weston Paper and Manufacturing Company in 1929.

In 1913, the Rockford Paper Mills, Inc., since discontinued, was purchased and in 1933 a mill in Peoria, Ill., also since discontinued, was acquired.

Perhaps the Weston Paper and Manufacturing Company's greatest contribution to the phenomenal growth of the corrugated box industry was the erection of its second straw paper mill in Terre Haute, Ind., in 1916 and 1917. Now, twenty-six years later, this mill still is the largest single producer of corrugated straw paper in existence.

By constantly replacing obsolete machinery with modern equipment and by developing new formulas and methods to improve its products, the Weston Paper and Manufacturing Company has maintained its position as the largest independent supplier in its field. Today its operating equipment consists of four straw paper machines and two liner board machines with a combined capacity of 600,000 pounds daily.

Its pride in maintaining the high quality of its products is proven by the fact that it identifies every foot of paper and board with a red stripe, from which is derived its trade-mark names of "Red Stripe" straw paper and "Red Stripe" jute liner board.

## Schroon River Co. Bankrupt

The Schroon River Pulp and Paper Company, manufacturer since 1901 at Warrensburg, N. Y., have filed a voluntary petition in bankruptcy in United States Court at Glens Falls, N. Y., with liabilities of $497,965 and assets of $32,000 in real estate, plant and equipment. Real estate is valued at $20,000 and machinery, $10,000.

The petition was signed by Fabian U. Rommelfanger, as president, North Adams, Mass., who was elected president after Paul E. Hodgon resigned. Hodgon, who is of Monroe Bridge, Mass., is a director and served as factor for the company. He is creditor for $217,829.

Mortgage bonds amount of $196,000, while unsecured claims are put at $271,638.

## Discuss Paper Requirements

WASHINGTON, D. C., January 20, 1943—Paper requirements for war and essential civilian use were discussed at a recent meeting of the Pulp and Paper Industry Advisory Committee in Washington.

Latest estimates from the Divisional Requirements Committee on war and essential civilian use requirements for paper and paperboard indicated that these products would be needed at an annual rate of approximately 14,300,000 tons. It was explained to the committee members that this figure is tentative only.

On the basis of the estimate of 14,300,000 tons the following three problems face the industry: (1) to reduce paper production to that level; (2) to keep it at that level as time goes on and expected raw material shortages threaten to reduce production below that figure; (3) to insure proper distribution of the paper produced in line with end use limitations.

Committee members also discussed the seven new orders affecting the consumption and production of paper. Government officials explained to members that Order M-241 as amended, which governs production of paper, is only a first step, and that production will be reduced in line with expected reduction of consumption. The real problem, it was stated, was to reconcile production and consumption with the available supply of wood.

Turning to the matter of waste, committee members said that owing to increasing shortages of wood it will be necessary to collect waste, but that it should be made certain that the right kind of waste, such as waste kraft containers, are collected. The right kinds of waste should be collected at the right places at the right time, members urged.

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**Screens**
**Wet Machines**
**Jordans and other Refiners**
**Pulpers**
**Shredders**
**Dusters**
**Paper Machines**
**De-inking equipment in general.**

**B. J. SNOW** 37 Wall St., New York City

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# New York Paper and Pulp Market Review

## Paper Market Active With Prospect of Reduced Supply for Trade Consumption—Chemical Pulp Market Strong—Rags Moderately Active—Demand for Low Grades of Paper Stock Now Heavy.

Office of the PAPER TRADE JOURNAL.
Wednesday, January 20, 1943.

An active demand for major grades of paper continues to be reflected in current reports received from many manufacturers' representatives, jobbers, and general paper merchants. Forward buying in expectancy of sharply limited supplies in the future, is attributed the reason in some quarters. With mercantile inventory control effective in the second quarter of this year, it has been pointed out, merchants should find no advantage in purchasing in excess of their normal or actual needs.

The index of general business activity for the week ended January 9, declined to 134.7%, from 136.8% for the preceding week, compared with 132.6% for the corresponding week last year. The index of paper board production, at 137.5%, was 5.9% higher than the preceding week, and compared with 176.5% for the corresponding week last year.

Paper production for the week ended January 9 was estimated at 86.6%, compared with 103.5% for 1942, with 88.4% for 1941, with 92.7% for 1940, and with 80.4% for the corresponding week for 1939.

Paper board production for the week ended January 9 was 82.0%, compared with 101.0% for 1942, with 77.0% for 1941, with 74.0% for 1940, and with 62.0% for the corresponding week for 1939.

The WPB Limitation Order L-245, issued January 8, 1943, limits the use of paper for books (32 pages or more), not issued periodically, to 90% of the amount of paper by weight, used in the manufacture of books in 1942.

The present inventory situation, states the Department of Commerce, is clearly one of shrinking civilian supplies. The index of the value of manufacturers' inventories of paper and allied products, for November, 1942, was 146.2, compared with 149.8 for October, and with a high of 154.6 for September. This compares with the index of the total of all non-durable goods of 150.2, for November, 1942, with 152.2 for October, and with 155.3, the high of the year for July.

The index value of manufacturers' shipments of paper and allied products for November, 1942, was 143, compared with 146 for October, and with 173, the high of the year in February and March 1942. The index for all non-durable goods was 179 for November, 1942, and 181 for October, which was the high point for 1942.

### Wood Pulp

Demand for chemical wood pulp continues heavy and this market is strong at this date. Demand for all bleached pulps is especially active and also for strong unbleached sulphite. The newsprint grade is more active. Groundwood is firm.

The recent abnormally cold weather in Canada is reported to have lowered production and slowed down shipments of pulp. Weather conditions now, however, are reported normal and production is getting back to normal. Transportation difficulties are, however, still apparent, as war requirements are heavy and are expected to increase.

### Rags

Mill buying of new cotton rags continues to be reported as moderate to good. Prices are firm and unchanged, with the trade expecting the OPA will issue a ceiling price schedule, possibly in a few weeks.

### Old Rope and Bagging

The old rope market reports no important change in prices or demand at this date. Mill buying of old No. 1 Manila rope continues steady at the ceiling price of $115 per ton. The OPA price schedule on small old Manila and on other grades, including sisal, is reported well maintained.

Trading in scrap bagging is reported in some quarters as a little improved, but this market is slow, with limited supplies widely reported.

### Old Waste Paper

Demand for the lower grades of waste paper continues to be reported active. Prices are firm, with No. 1 mixed paper and old corrugated boxes particularly strong at this date.

### Twine

Good demand is reported in many grades of twine this week. Prices are firm on all standard grades of hard and soft fiber twines. Restrictions in the use of imported fiber cordage and twine continue in effect.

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## Newsprint Production Lower

Production of newsprint in Canada during December 1942 amounted to 244,191 tons and shipments to 243,530 tons, according to the News Print Service Bureau. Production in the United States was 74,655 tons and shipments 75,222 tons, making a total United States and Canadian newsprint production of 318,846 tons and shipments of 318,752 tons. During December, 19,436 tons of newsprint were made in Newfoundland, so that the North American production for the month amounted to 338,282 tons. Total production in December 1941 was 406,953 tons.

The North American output of newsprint paper in 1942 was 4,407,144 tons, of which 3,177,102 tons was made in Canada, 952,616 tons in the United States, and 277,426 tons in Newfoundland. The Canadian output was 7.3 percent less than in 1941, that in the United States 6.1 percent less, with a loss of 19.5 percent in Newfoundland, making a continental decrease of 378,433 tons or 7.9 percent.

Stocks of newsprint paper at the end of December were 91,986 tons at Canadian mills and 9,601 tons at United States mills, making a combined total of 101,587 tons compared with 101,493 tons on November 30, 1942, and 131,157 tons at the end of December 1941.

## FOR THE DURATION

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We are in a position to furnish replacement fillings and repair parts in accordance with war production board rulings.

Hermann employees are proud possessors of the 10% minute man flag, for over 10% of their wages being deducted for war bonds.

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NEWARK, NEW JERSEY

SALES OFFICES IN PRINCIPAL CITIES

## MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL.
Wednesday, January 20, 1943.

BLANC FIXE—Prices on blanc fixe are firm and unchanged and conform to prevailing market levels. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is currently quoted at $60 per ton, f.o.b., works. Demand reported good for the week.

BLEACHING POWDER — Quotations on bleaching powder are firm. Demand reported active for the week. Bleaching powder is currently quoted at $2.50 per 100 pounds, in drums, at works.

CASEIN—Prices on casein are unchanged for the current week. Standard domestic casein, 20-30 mesh, is currently quoted at 19 cents per pound; 80-100 mesh, at 19½ cents per pound. All prices in bags, car lots. Argentina casein, 20-30 mesh, at 9 cents per pound, c.i.f., is nominal. No quotations on French casein.

CAUSTIC SODA—Quotations on caustic soda continue unchanged at prevailing market prices. Demand reported improved. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds in drums, car lots, at works.

CHINA CLAY—Prices on china clay are firm and conform to prevailing market levels. Demand reported moderate at this date. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay at from $12 to $22 per ton, at mines. Imported clay is currently offered at from $13 to $25 per ton, ship side.

CHLORINE—Quotations on chlorine are firm and unchanged. Market strong. Government demand is reported heavy during the current week. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN — The rosin market is reported firm for the week with higher prices on some grades. "G" gum rosin is currently quoted at $3.50 per 100 pounds, in barrels. Savannah "F" wood rosin is currently quoted at $3.45 per 100 pounds, in barrels, New York. Seventy per cent gum rosin size is quoted at $3.68 per 100 pounds, f.o.b., works.

SALT CAKE—Prices on salt cake are firm. Demand moderate for the current week. Domestic salt cake is currently quoted at $15 per ton, in bulk; chrome salt cake at $16 per ton. Restrictions on chrome cake removed. All prices in car lots, f.o.b., shipping point. The quotation of $16 per ton on imported salt cake is nominal.

SODA ASH — Quotations on soda ash are firm and continue to conform to prevailing market levels. Demand reported good for the week. Prices on soda ash in car lots, per 100 pounds, are as follows: in bulk, $90; in paper bags, $1.05; and in barrels, $1.35.

STARCH — Prices on corn starch are reported unchanged for the current week. Pearl is currently quoted at $3.10 per 100 pounds; powdered starch at $3.20 per 100 pounds. All prices in bags, carlots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Demand reported fair for the current week. The commercial grades are currently quoted at from $1.15 to $1.25; iron free at from $1.75 to $1.85 per 100 pounds. All prices in bags, carlots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and conform to prevailing market levels. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby carlots are quoted at $18 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $15 to $21 per ton, at mines. No quotations on imported talc.

## MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

### Paper

(Delivered New York)

| | | | |
|---|---|---|---|
| News, per ton— | | | |
| Roll, contract | $50.00 | ● | — |
| Sheets | 58.00 | " | — |
| Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill | | | |
| Superstandard Wrapping | $5.00 | ● | — |
| No. 1 Wrapping | 4.75 | " | — |
| Standard Wrapping | 4.50 | " | — |
| Standard Bag | 4.125 | " | — |
| Tissues—Per Ream—Carlots | | | |
| White No. 1 | 1.12½ | " | — |
| White No. 1 M. G. | 1.05 | " | — |
| White No. 1½ | 1.00 | " | — |
| White No. 2 | 1.00 | " | — |
| Anti-Tarnish M. G. | .95 | " | — |
| Colored | — | " | — |
| Kraft | .95 | " | — |
| Manila | .90 | " | — |
| Unbl. Toilet, 1 M. | 4.16 | " | — |
| Bleached Toilet | 5.70 | " | — |
| Paper Towels, Per Case— | | | |
| Unbleached, Jr. | 2.35 | " | — |
| Bleached, Jr. | 2.65 | " | — |
| Manila—per cwt.—C. l. f. s. | | | |
| No. 1 Jute | 11.25 | ● | — |
| No. 1 Manila Wrapping, 35 lb. | 5.50 | " | 5.75 |
| No. 2 Manila Wrapping, 35 lb. | 5.25 | " | 5.50 |
| Boards, per ton— | | | |
| News | *48.00 | ● | — |
| Chip | *45.00 | " | — |
| Sgl. Mla. LL Chip | *60.00 | " | — |
| White Pat. Coated | *75.00 | " | — |
| Kraft Liners 50 lb. | *60.00 | " | — |
| Binders Boards | 84.00 | " | 116.00 |

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; egular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

| | Bonds | Ledgers |
|---|---|---|
| 100% Rag Ext. No. 1 | $39.10@$46.00 | $40.25@$47.25 |
| 100% Rag | 32.20 " 37.75 | 33.35 " 39.25 |
| % Rag | .... " .... | 29.90 " 35.00 |
| 75% Rag | 23.00 " 27.00 | 24.15 " 28.25 |
| 65% Rag | .... " .... | 22.80 " 27.75 |
| 50% Rag | 18.70 " 22.75 | 19.90 " 24.25 |
| % Rag | 16.40 " 20.00 | 17.55 " 21.50 |

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

| | Bonds | Ledgers |
|---|---|---|
| No. 1 | $10.55@$12.75 | $11.70@$14.25 |
| No. 2 | 9.65 " 11.75 | 10.80 " 13.25 |
| No. 3 | 9.20 " 11.25 | 10.35 " 12.50 |
| No. 4 | 8.90 " 10.75 | 10.05 " 12.25 |

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper.

Delivered in Zone 1:

| | | | |
|---|---|---|---|
| No. 1 Glossy Coated | $13.65 | @ | $13.9 |
| No. 2 Glossy Coated | 12.40 | " | 14.0 |
| No. 3 Glossy Coated | 11.60 | " | 13.2 |
| No. 4 Glossy Coated | 11.15 | " | 12.7 |
| No. 1 Antique (watermarked) | 10.25 | " | 11.7 |
| No. 2 Offset | 9.60 | " | 11.0 |
| A Grade E. F. | 9.35 | " | 10.7 |
| A Grade S. & S. C. | 9.60 | " | 11.0 |
| B Grade E. F. | 8.85 | " | 10.2 |
| B Grade S. & S. C. | 9.10 | " | 10.5 |
| C Grade E. F. | 8.55 | " | 9.7 |
| C Grade S. & S. C. | 8.80 | " | 10.0 |
| D Grade E. F. | 8.25 | " | 9.5 |
| D Grade S. & S. C. | 8.50 | " | 9.7 |

Ivory & India at $.50 cwt. extra.

### Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight to Destination.

| | |
|---|---|
| Bl. Softwood Sulphite | $76.0 |
| Unbl. Softwood Sulphite | 64.00 @ 66.0 |
| Bl. Hardwood Sulphite | 73.5 |
| Unbl. Hardwood Sulphite | 63.5 |
| Bl. Mitscherlich | 81.0 |
| Unbl. Mitscherlich | 72.0 |
| N. Bleached Sulphate | 86.0 |
| S. Bleached Sulphate | 79.0 |
| N. Semi-Bleached Sulphate | 82.0 |
| S. Semi-Bleached Sulphate | 75.0 |
| N. Unbl. Sulphate | 73.0 |
| S. Unbl. Sulphate | 63.5 |
| Bl. Soda | 66.0 |
| Unbl. Soda | 62.0 |
| Groundwood | 46.0 |

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

| | Below 50% Air Dry Weight |
|---|---|
| Northeast | $13.50 |
| Lake Central | 13.50 |
| Southern | 16.00 |
| West Coast (in area) | 10.50 |
| West Coast (out area) | 16.50 |

| | 50%-80% Air Dry Weight |
|---|---|
| Northeast | $11.50 |
| Lake Central | 11.50 |
| Southern | 14.00 |
| West Coast (in area) | 9.50 |
| West Coast (out area) | 15.50 |

Applying to Producers of Dry Wood Pulp.

| | Above 80% Air Dry Weight |
|---|---|
| Northeast | $8.50 |
| Lake Central | 8.50 |
| Southern | 11.00 |
| West Coast (in area) | 7.50 |
| West Coast (out area) | 13.50 |

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

### Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New White, No. 1. | 6.50 | @ | 6.75 |
| Silesias No. 1 | 4.50 | " | 4.75 |
| New Unbleached | 6.50 | " | 6.75 |
| Blue Overall | 5.00 | " | 5.25 |
| Fancy | 3.50 | " | 3.75 |
| Washables | 2.75 | " | 3.00 |
| Mixed Khaki Cuttings | 2.75 | " | 3.00 |
| O. D. Khaki Cuttings | 3.25 | " | 3.50 |

# THE HUBBS HOUSES

*A business that was established in 1855*

CHARLES F. HUBBS & COMPANY
Lafayette Street Warehouse
Beekman Street Warehouse
New York, N. Y.

HUBBS & CORNING COMPANY
Baltimore, Md.

HUBBS & HOWE COMPANY
Buffalo, New York

HUBBS & HASTINGS PAPER COMPANY
Rochester, New York

CHARLES F. HUBBS & COMPANY
Bridgeport, Conn.

INTERSTATE CORDAGE & PAPER COMPANY
Pittsburgh, Pa.

THOMAS J. NAGLE PAPER CORPORATION
Hollis, New York

HUBBS & HOWE COMPANY
Cleveland, Ohio

HOLLAND PAPER COMPANY
Buffalo, New York

CHARLES F. HUBBS & COMPANY
Troy, New York

VICTORIA PAPER & TWINE COMPANY LIMITED
Toronto, Ontario, Canada

VICTORIA PAPER & TWINE COMPANY LIMITED
Montreal, Quebec, Canada

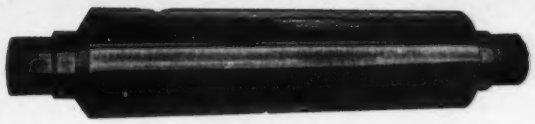
VICTORIA PAPER & TWINE COMPANY LIMITED
Halifax, Nova Scotia, Canada

GARDEN CITY PAPER MILLS COMPANY LIMITED
St. Catharines, Ontario, Canada

CANADIAN VEGETABLE PARCHMENT PAPER COMPANY LIMITED
Merritton, Ontario, Canada



# FARREL ROLLS



## FOR LOW MAINTENANCE COSTS

Farrel rolls retain their accuracy of bodies and journals longer due to close, scientific control of materials, metal mixing, casting and finishing developed in over eighty years of experience in roll making.

Chilled body surfaces are uniform in hardness and depth; the shape and amount of crown are mathematically correct; bodies and journals are accurately and smoothly ground. These characteristic qualities make Farrel Rolls consistently low in maintenance cost.

Made in chilled iron, extra-hard Farreloy or Farrel Ni-Hard, in any diameter from 4" to 72" and any length up to 312".

FARREL-BIRMINGHAM COMPANY, INC.
50 State St., Ansonia, Conn.



# ZOPAQUE RG

**Pure $TiO_2$**

This grade of $TiO_2$ shows highest developments of aqueous dispersion and suspension yet attained.

Now available in any quantity without priority, but we will appreciate extension of any priorities available when ordering.

*Sole Selling Agents:*
The Chemical & Pigment Company
Baltimore, Md. · Collinsville, Ill. · Oakland, Calif.
*Manufactured by*
American Zirconium Corporation
Baltimore, Maryland



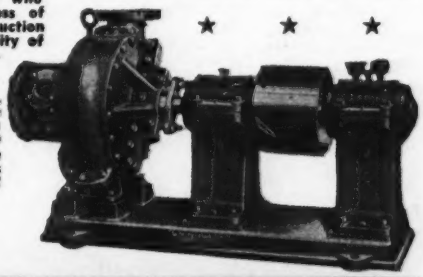
FULL SPEED PRODUCTION TO MEET GREAT NEW NEEDS

★ *Continuous Pumping of High Consistency Stocks—without clogging, without shut-downs!*

We take into account the nature of the stock, its consistency, the piping layout, and all the other factors that enter into your operating conditions. And, each FREDERICK stock pump is engineered especially to meet the specific conditions under which it must operate.

Consequently, FREDERICK pumps are considered the unit for low cost, high efficiency pumping by leading paper mills who have used them for many years . . . and who know the soundness of FREDERICK construction and the dependability of FREDERICK operation.

★ ★ ★ ★



★ Remember, FREDERICK is the pump that is *GUARANTEED* to meet fully the operating conditions for which it is sold!

*Details upon request. No obligation.*

*Frederick* STOCK
# PUMPS
The FREDERICK IRON & STEEL CO., Frederick, Md.

### Old Rags

| | | | |
|---|---|---|---|
| White, No. 1— | | | |
| Repacked | *3.80 | " | — |
| Miscellaneous | *3.20 | " | — |
| White, No. 2— | | | |
| Repacked | *2.90 | " | — |
| Miscellaneous | *2.65 | " | — |
| Third and Blues— | | | |
| Repacked | *2.20 | " | — |
| Miscellaneous | *1.80 | " | — |
| Roofing Rags— | | | |
| No. 1 | *1.55 | " | — |
| No. 2 | *1.45 | " | — |
| No. 3 (bagging) | *1.35 | " | — |
| No. 4 | *1.35 | " | — |
| No. 5A | *1.35 | " | — |
| Old Manila Rope | 5.75 | " | — |

OPA Maximum Prices.

### Foreign Rags

All prices nominal

| New Rags | | | |
|---|---|---|---|
| New Dark Cuttings | 2.25 | @ | 2.40 |
| New Mixed Cuttings | 2.00 | " | 2.20 |
| New Light Silesias | 5.50 | " | 5.75 |
| Light Flannelettes | 5.50 | " | 5.75 |
| New White Cuttings | 7.00 | " | 7.50 |
| New Light Oxfords | 4.00 | " | 4.50 |
| New Light Prints | 3.00 | " | 3.25 |
| **Old Rags** | | | |
| No. 1 White Linens | 7.50 | " | 8.50 |
| No. 2 White Linens | 6.50 | " | 7.50 |
| No. 3 White Linens | 4.50 | " | — |
| No. 4 White Linens | 2.25 | " | 3.25 |
| No. 1 White Cotton | 4.25 | " | 4.75 |
| No. 2 White Cotton | 3.25 | " | 3.75 |
| No. 3 White Cotton | 2.50 | " | 3.00 |
| No. 4 White Cotton | 1.90 | " | 2.20 |
| Extra Light Prints | 2.00 | " | 2.40 |
| Ord. Light Prints | 1.75 | " | 2.15 |
| Med. Light Prints | 1.55 | " | 1.95 |
| Dutch Blue Cottons | 2.25 | " | 2.50 |
| French Blue Linens | 3.00 | " | — |
| Checks and Blues | 2.00 | " | — |
| Linsey Garments | 1.90 | " | 2.00 |
| Dark Cottons | 1.50 | " | 1.60 |
| Old Shopperies | 1.30 | " | 1.45 |
| New Shopperies | 1.45 | " | 1.50 |
| French Blues | 2.25 | " | 2.50 |

### BAGGING

(Prices to Mill, f. o. b. N. Y.)

| | | | |
|---|---|---|---|
| Gunny No. 1— | | | |
| Foreign | Nominal | | |
| Domestic | 4.00 | @ | 4.25 |
| Wool Tares, light | 4.25 | " | 4.50 |
| Wool Tares heavy | 4.50 | " | 4.75 |
| Bright Bagging | 4.50 | " | 4.85 |
| Manila Rope— | | | |
| Foreign | — | " | — |
| Domestic | *5.75 | " | — |
| Jute Threads | 4.25 | " | 4.75 |
| Sisal Strings | *3.00 | " | 4.00 |
| Mixed Strings | 1.10 | " | 1.20 |

* OPA Maximum Price.

### Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices

| | | | |
|---|---|---|---|
| No. 1 Hard White Envelope Cuts, one cut | 3.37½ | @ | — |
| No. 1 Hard White Envelope Cuts | 3.12½ | " | — |
| No. 1 Hard White Shavings, unruled | 2.87½ | " | — |
| No. 1 Hard White Shavings, ruled | 2.50 | " | — |
| Soft White Shavings, one cut | 2.87½ | " | — |
| No. 1 Soft White Shavings | 2.50 | " | — |
| Soft White Shavings, Misc. | 2.15 | " | — |
| No. 1 Fly Leaf Shavings | 1.67½ | " | — |
| No. 2 Fly Leaf Shavings | 1.12½ | " | — |
| No. 1 Groundwood Fly Leaf Shavings | 1.25 | " | — |
| No. 2 Mixed Groundwood Fly Leaf Shavings | .90 | " | — |
| Mixed Colored Shavings | .75 | " | — |
| Mixed Groundwood Colored Shavings | .90 | " | — |
| Overissue Magazines | 1.67½ | " | — |
| No. 1 Heavy Books & Magazines | 1.57½ | " | — |
| Mixed Books | .85 | " | — |
| No. 1 White Ledger | 2.17½ | " | — |
| No. 2 Mixed Ledger, colored | 1.87½ | " | — |
| New Manila Envelope Cuttings, one cut | 2.87½ | " | — |
| New Manila Envelope Cuttings | 2.65 | " | — |
| Extra Manilas | 1.85 | " | — |
| Mixed Kraft, Env. & Bag Cuttings | 2.75 | " | — |
| Kraft Envelope Cuttings | 3.25 | " | — |
| Triple Sorted, No. 1 Brown Soft Kraft | 2.50 | " | — |
| New 100% Kraft Corrugated Cuttings | 2.35 | " | — |
| No. 1 Assorted Old Kraft | 1.75 | " | — |
| New Jute Corrugated Cuttings | .90 | " | — |
| Old Kraft Corrugated Containers | 1.50 | " | — |
| Box Board Cuttings | .72½ | " | — |
| White Blank News | 1.65 | " | — |
| Overissue News | .85 | " | — |
| No. 1 News | .75 | " | — |
| No. 1 Mixed Paper | .70 | " | — |
| Old Corrugated Containers | .82½ | " | — |
| Mill Wrappers | .85 | " | — |

### Twines

(F. o. b. Mill)

(Soft Fiber)

| | | | |
|---|---|---|---|
| Coarse Polished— | | | |
| India | .21 | @ | — |
| White Hemp | .21 | " | — |
| Fine Polished— | | | |
| Fine India | .26 | " | — |
| Unpolished— | | | |
| Box | .17¼ | " | — |
| Paper Makers | .17 | " | — |
| Tube Rope | .19 | " | — |
| Wall Paper | .20½ | " | — |
| Wrapping | .23 | " | — |
| Soft Fiber Rope | .19 | " | — |
| Cotton | .25 | " | — |
| (Hard Fiber) | | | |
| Medium Java | .18 | " | — |
| Mex. Sisal | .16 | " | — |
| Manila | — | " | — |

## PHILADELPHIA

### Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New White No. 1 | .07½ | @ | .07½ |
| New White No. 2 | .04½ | " | .05 |
| Light Silesias | .04½ | " | .04¾ |
| Silesias, No. 1 | .04 | " | .04¼ |
| Black Silesias, soft | .03¾ | " | .04 |
| New Unbleached | .07¼ | " | .07½ |
| Washable Prints | .03¾ | " | .03½ |
| Washable No. 1 | .02 | " | .02¼ |
| Blue Overall | .04½ | " | .05½ |
| Cottons—According to grades— | | | |
| Washable shredding | — | " | .01¾ |
| Fancy Percales | .03¼ | " | .03½ |
| New Black Soft | .02¾ | " | .03 |
| New Dark Seconds | 1.75 | " | 2.00 |
| Khaki Cuttings— | | | |
| No. 1 O. D. | .03 | " | .03¼ |
| No. 2 Mixed | .02¼ | " | .02½ |
| Corduroy | .01¾ | " | .02¼ |
| New Canvas | .04¾ | " | .05¼ |
| New Black Mixed | — | " | .02½ |

### Domestic Rags (Old)

| | | | |
|---|---|---|---|
| White No. 1 — Repacked | 3.80 | " | — |
| White No. 2 — Repacked | 2.90 | " | — |
| Miscellaneous No. 1 | 3.20 | " | — |
| Miscellaneous No. 2 | 2.65 | " | — |
| Thirds and Blues— | | | |
| Miscellaneous | 1.80 | " | — |
| Repacked | 2.20 | " | — |
| Black Stockings— (Export) | Nominal | | |
| Roofing Stock— | | | |
| Foreign No. 1 | Nominal | | |
| Domestic No. 1 | 1.55 | " | — |
| Domestic No. 2 | 1.45 | " | — |
| Roofing Bagging | 1.35 | " | — |
| Old Manila Rope | 5.75 | " | — |

### Bagging

(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Gunny No. 1— | | | |
| Foreign | Nominal | | |
| Domestic | 3.00 | " | 3.50 |
| Sisal Rope | 3.75 | " | — |
| Mixed Rope | .75 | " | 1.00 |
| Scrap— | | | |
| No. 1 | 3.25 | " | 3.50 |
| No. 2 | 1.75 | " | 1.80 |
| Wool Tares, heavy | 4.00 | " | 4.25 |
| No. 1 New Light Burlap | 3.90 | " | 4.00 |
| New Burlap Cuttings | 3.75 | " | 4.00 |

### Old Papers

(F. o. b. Phila.)

OPA Maximum Prices

| | | | |
|---|---|---|---|
| No. 1 Hard White Envelope Cuts, one cut | 3.37½ | " | — |
| No. 1 Hard White Shavings, unruled | 2.50 | " | — |
| Soft White Shavings, one cut | 2.87½ | " | — |
| White Blank News | 1.65 | " | — |
| Soft White Shavings, Misc. | 2.15 | " | — |
| No. 1 White Ledger, | 2.17½ | " | — |
| No. 2 Ledger, colored | 1.87½ | " | — |
| No. 1 Heavy Books & Magazines | 1.57 | " | — |
| Overissue Magazines | 1.67½ | " | — |
| New Manila Envelope Cuttings | 2.65 | " | — |
| No. 1 Assorted Old Kraft | 1.75 | " | — |
| No. 1 Mixed Paper | .70 | " | — |
| Box Board Cuttings | .72½ | " | — |
| Jute Corrugated Cuttings | .90 | " | — |
| Overissue News | .85 | " | — |
| No. 1 News | 1.00 | " | — |

## BOSTON

### Old Papers

(F. o. b. Boston)

OPA Maximum Prices

| | | | |
|---|---|---|---|
| No. 1 Hard White Shavings, unruled | 2.87½ | @ | — |
| No. 1 Hard White Shavings, ruled | 2.50 | " | — |
| Soft White Shavings, Misc. | 2.15 | " | — |
| No. 1 Fly Leaf Shavings | 1.67½ | " | — |
| No. 2 Fly Leaf Shavings | 1.12½ | " | — |
| No. 1 Groundwood Fly Leaf Shavings | 1.25 | " | — |
| No. 2 Groundwood Fly Leaf Shavings | .90 | " | — |
| Mixed Colored Shavings | .75 | " | — |
| New Manila Envelope Cuts, one cut | 2.87½ | " | — |
| Hard White Envelope Cuts, one cut | 3.37½ | " | — |
| Triple Sorted No. 1 Brown Soft Kraft | 2.50 | " | — |
| Mixed Kraft Env. & Bag Cuttings | 2.75 | " | — |
| Kraft Envelope Cuttings | 3.25 | " | — |
| No. 1 Heavy Books & Magazines | 1.57 | " | — |
| New Manila Envelope Cuts, one cut | 2.87½ | " | — |
| New Manila Envelope Cuttings | 2.65 | " | — |
| White Blank News | 1.65 | " | — |
| No. 1 Assorted Old Kraft | 1.75 | " | — |
| No. 1 Mixed Paper | .70 | " | — |
| Overissue News | .85 | " | — |
| Box Board Cuttings | .72½ | " | — |
| New Corrugated Cuttings, Kraft | 2.25 | " | — |
| Old Corrugated Containers | 1.00 | " | — |
| Jute Corrugated Cuttings | 1.07½ | " | — |

### Bagging

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Gunny Bagging— | | | |
| Foreign | (nominal) | | |
| Domestic | 3.50 | @ | 4.00 |
| Sisal Rope | 4.50 | " | 4.75 |
| Mixed Rope | 1.35 | " | 1.50 |
| Transmission Rope— | | | |
| Foreign | (nominal) | | |
| Domestic | 3.00 | " | 3.50 |
| Manila Rope— | | | |
| Foreign | (nominal) | | |
| Domestic | 5.75 | " | — |
| Soft Jute Rope | 4.75 | " | 5.25 |
| Jute Carpet Threads | 3.25 | " | 3.50 |
| Bleachery Burlap | 8.50 | " | 9.00 |
| Scrap Burlap— | | | |
| Foreign | (nominal) | | |
| Domestic | 3.50 | " | 3.75 |
| Scrap Sisal | 4.50 | " | 4.75 |
| Scrap Sisal for Shredding | — | " | .04¼ |
| Wool Tares— | | | |
| Foreign | (nominal) | | |

| | | | |
|---|---|---|---|
| Soft White Shavings, Misc. | 2.15 | " | — |
| No. 1 White Ledger | 2.17½ | " | — |
| No. 2 Ledger, colored | 1.87½ | " | — |
| No. 1 Heavy Books & Magazines | 1.57 | " | — |
| Overissue Magazines | 1.67½ | " | — |
| New Manila Envelope Cuttings | 2.65 | " | — |
| No. 1 Assorted Old Kraft | 1.75 | " | — |
| No. 1 Mixed Paper | .70 | " | — |
| Box Board Cuttings | .72½ | " | — |
| Jute Corrugated Cuttings | .90 | " | — |
| Overissue News | .85 | " | — |
| No. 1 News | 1.00 | " | — |

### Old Rags

| | | | |
|---|---|---|---|
| Domestic | 5.00 | " | 5.75 |
| Aust. Wool Pouches | 5.10 | " | 5.25 |
| New Burlap Cuttings | 5.00 | " | 5.25 |
| Heavy Baling Bagging | 4.25 | " | 4.75 |
| Paper Mill Bagging | 2.75 | " | 3.00 |
| No. 2 Bagging | 1.35 | " | — |

* OPA Maximum Price

### Domestic Rags (New)

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New Light Prints | .04½ | @ | .04¾ |
| Fancy Percales | .04¼ | " | 05 |
| New White No. 1 | .06¾ | " | .06¾ |
| New Light Flannelettes | .05½ | " | .06 |
| Canton Flannels, Bleached | .06 | " | .06¾ |
| Underwear Cutters, Bleached | .06 | " | .06¾ |
| Underwear Cutters, Unbleached | .05¾ | " | .06 |
| Silesias No. 1 | .06 | " | .06¾ |
| New Black Silesias | .03 | " | .03¾ |
| Red Cotton Cuttings | .03¼ | " | 04 |
| Soft Unbleached | .06½ | " | .06¾ |
| Blue Cheviots | .05½ | " | .06 |
| Fancy | .02¾ | " | — |
| Washable | .02¾ | " | — |
| Khaki Cuttings | .02¾ | " | .03 |
| O. D. Khaki | .03½ | " | .03¾ |
| Corduroy | .03¼ | " | .03¾ |
| New Canvas | .06¼ | " | .06¾ |
| B. V. D. Cuttings | .06¼ | " | .06¾ |

### Domestic Rags (Old)

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| White No. 1— | | | |
| Repacked | 3.80 | @ | — |
| Miscellaneous | 3.20 | " | — |
| White No. 2— | | | |
| Miscellaneous | 2.65 | " | — |
| Twos and Blues, Repacked | 2.20 | " | — |
| Old Blue Overalls | 2.25 | " | 2.50 |
| Thirds and Blues, Repacked | 2.20 | " | — |
| Miscellaneous | 1.80 | " | — |
| Black Stockings | 3.50 | " | 4.00 |
| Roofing Stock— | | | |
| No. 1 | 1.55 | " | — |
| No. 2 | 1.45 | " | — |
| No. 3 | 1.35 | " | — |
| No. 4 | 1.35 | " | — |
| No. 5, Quality A | 1.35 | " | — |
| Quality B | 1.20 | " | — |
| Quality C | .95 | " | — |
| * Old Manila Rope | 5.75 | " | — |

* OPA Maximum Prices.

### Foreign Rags

(F. o. b. Boston)

| | |
|---|---|
| Canvas | (nominal) |
| Dark Cottons | (nominal) |
| Dutch Blues | (nominal) |
| New Checks and Blues | (nominal) |
| Old Fustians | (nominal) |
| Old Linsey Garments | (nominal) |
| New Silesias | (nominal) |

## CHICAGO

### Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices.

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White Envelope Cuts, one cut | 3.37½ | " | — |
| No. 1 Hard White Shavings, unruled | 2.50 | " | — |
| No. 1 Soft White Shavings | 2.80 | " | — |
| No. 1 White Ledger | 2.17½ | " | — |
| No. 1 Heavy Books & Magazines | 1.57 | " | — |
| White Blank News | 1.65 | " | — |
| Mixed Kraft Env. & Bag Cuttings | 2.75 | " | — |
| No. 1 Assorted Old Kraft | 1.75 | " | — |
| Overissue News | .85 | " | — |
| No. 1 News | .75 | " | — |
| No. 1 Mixed Paper | .70 | " | — |
| No. 1 Roofing Rags | 1.55 | " | — |
| No. 1 Roofing Bags | 1.45 | " | — |